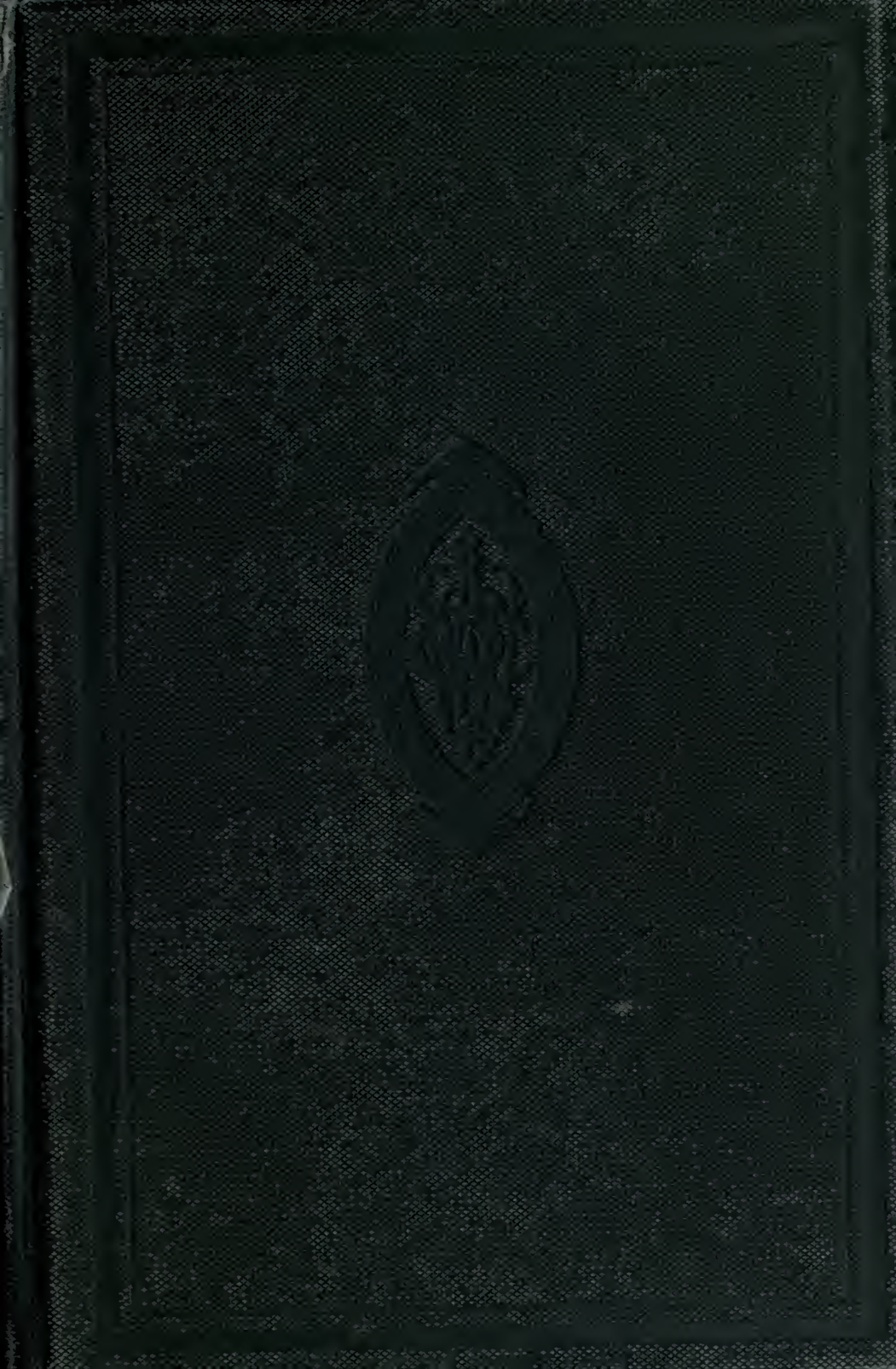

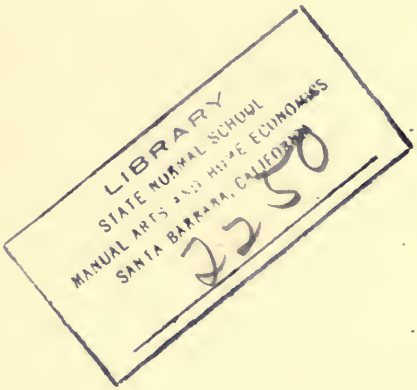
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# TICS AND THEIR TREATMENT

# TICS AND THEIR TREATMENT

By HENRY MEIGE AND E. FEINDEL

With a Preface by
Professor Brissaud

TRANSLATED and EDITED, with a CRITICAL APPENDIX
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# PREFACE

NOTHING could be less scientific than the establishment of a hierarchy among medical problems based on the relative severity of symptoms. Prognosis apart, there can be no division of diseases into major and minor.

Hitherto no great importance has been attached to those reputedly harmless "movements of the nerves" known as tics: an involuntary grimace, a peculiar cry, an unexpected gesture, may constitute the whole morbid entity, and scarcely invite passing attention, much less demand investigation. Yet it is the outcome of ignorance to relegate any symptom to a secondary place, for we forget that difficult questions are often elucidated by apparently trivial data. A fresh proof of the truth of this remark is to be found in the accompanying volume, to which MM. Meige and Feindel have devoted several years of observation.

To begin with, they must be congratulated on having done justice to the word *tic*. No doubt its origin is commonplace and its form unscientific, but its penetration into medical terminology is none the less instructive. If popular expression sometimes confounds where experts distinguish, in revenge it is frequently so apt that it forces itself into the vocabulary



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of the scientist. In the case under consideration Greek and Latin are at fault. The meaning of the word tic is so precise that a better adaptation of a name to an idea, or of an idea to a name, is scarcely conceivable, while the fact of its occurrence in so many languages points to a certain specificity in its definition.

Yet till within recent years tic had all but disappeared from the catalogue of diseases. A closer study of reflex acts, however, has led to the grouping together of various clonic convulsions of face or limbs, including "spasms" on the one hand, and, on the other, conditions of an entirely different nature, for which the term "tics" ought to be reserved. The separation of "tics" from "spasms," properly so called, has been the object of various experiments and observations made by the authors and by myself, the practical value of which is evidenced by their disclosure of efficacious therapeutic measures.

Among the confused varieties of spasm, clonus, hyperkinesis, etc., it is impossible not to recognise the obvious individuality of certain motor affections—certain movements of defence, of expression, of mimicry, certain gestures more or less co-ordinated for some imaginary end—all readily distinguishable from spasms, fibrillary contractions, and choreiform or athetotic movements. It is only logical to attribute a somewhat more complex origin to these varying gestures, in which the influence of the will, however unperceived in the end, is always to be detected at the beginning.

While some convulsions and spasms are the product of special changes in muscle fibre, or motor nerve, or

spinal cord, in medulla, pons, or basal nuclei, the synergic and co-ordinated muscular contractions of tic imply cortical intervention. The will may not play a conscious rôle therein, but the cortex alone is capable of initiating such acts. What part does it take in their genesis?

For an instance, a simple blinking of the eyelids may form a tic. Considered in itself, it is a movement of defence against dust or light; but in the absence of irritation it becomes meaningless. How then are we to explain the abruptness and intensity of contraction of the orbicularis palpebrarum, and of this muscle alone? If it were due to stimulation at some point on the reflex facial arc, other facial muscles ought to be involved; if referable to isolated excitation of the orbicularis filaments of the facial nerve, why is the contraction bilateral? It is evident we are dealing here not with a simple reflex of bulbar origin, but with a movement at once premeditated and purposive, and it is this purposive element, presupposing, as it does, co-ordination of contraction, that indicates the cortical nature of the phenomenon. Such co-ordinated movements, however causeless and inopportune they may appear, cannot be identified with mere pathological reflexes or spasms. They are tics.

Such, since the days of Trousseau and Charcot, has been the teaching of the Paris School of Medicine. Nevertheless, confusion remains, and in many text-books the unfortunate sacrifice of analytical accuracy to a premature desire for the schematic classification of disease has not tended to lessen it.

The authors of this volume have been resolute in their reference of the pathogeny of tic to a mental

process. It is true, recognition of the psychological aspect of the affection is ready enough where the tic corresponds or is superadded to other "episodic stigmata of degeneration"; but the task is infinitely more delicate should the sole indication of an abnormal psychical state be the tic itself. Even in these cases examination always reveals insufficiency of inhibition, to which are due the inception and the persistence of many "bad habits." We can thus appreciate the rôle of habit in the evolution of tics, and recognise the analogy they offer to all functional acts. A tic is frequently nought else than the ill-timed and inapposite execution of some function. We may even conceive a sort of functional tic centre, formed by nerve elements corresponding to the functional grouping of the muscles involved in the tic. In advanced cases we may imagine some sort of hypertrophy of this functional centre, which may be reduced by suppression of function—that is to say, by certain methods of immobilisation.

This is the secret of the treatment of tics, and to ignore it would be disastrous. As a matter of fact, tic is not merely a neurosis, but a psychoneurosis, or, to be more exact, a psychomotor encephalopathy. The degeneration whose first manifestation in a child is the development of a tic may reveal itself later by more disquieting signs. This word "degeneration" is employed either too indefinitely or too explicitly by those who are ignorant of its true meaning in medicine. To-day the physician's diagnosis is often anticipated by the parents, who are willing to own their child "nervous" because of his tic; but they are not so ready to admit he has a tic because he is

nervous, as they would infer immediately that they have begotten a degenerate. The consolation of "superior degeneration" does not exclude a certain degree of humiliation.

No doubt superficial study is content to characterise children thus afflicted by the simple epithet "nervous," on the ground that their tic does not constitute a menace to life. But a tic in itself can never be a negligible quantity. The more it is repeated the more inveterate it becomes, and the greater the likelihood of its becoming generalised; at the same time the influence of the neuropathic diathesis is intensified. An analogy might be drawn between the tics and chorea. Prognosis, even in a mild case of adult chorea, should always be guarded, inasmuch as once the ordinary limits of the duration of the disease are over-stepped, we find ourselves face to face with the dreaded chronic variety.

The same attitude might be adopted in reference to the distressing neurosis described by Charcot and Gilles de la Tourette as the "disease of the tics," which is no more than the superlative expression of a neuropathic and psychopathic disposition entirely akin to that favouring the development of the most harmless tic. Its earliest exhibition is a series of apparently insignificant bizarre convulsions; but its indefinite prolongation, its gradual involvement of one limb after another, its association with grave mental symptoms, and its frequent termination in dementia, are reason enough for eyeing the first little premonitory tic with mistrust, and combating it with vigour.

From the motor aspect a tic is only a "bad habit," and the checking of bad habits, especially in the predisposed, must be our goal from the outset. And,

should we succeed, there will be reason for congratulation, not on the happy issue of appropriate treatment for a particular tic, but because the result is a step towards *the habit of correcting bad habits.* Reinforcement of the will is the prime therapeutic indication, but the physician has no need to resort to mysterious subterfuges or occult practices; let him borrow the virtues of the successful teacher. The amelioration consequent on this procedure is seen not only in the recovery of lost aptitude for work, but also in the simultaneous restoration of self-confidence and will-power in patients who had appeared deprived of them for ever. The treatment of tic is evidence of its nature and curability. Since 1893 MM. Meige and Feindel have subjected their cases to the educational discipline of systematised movement and of immobilisation. In contrast to the tendency of ordinary exercises to render certain useful acts automatic, this method aims at the suppression of automatic acts that have become useless. The development of the general principles of the method, as well as an exposition of recent modifications and their application to particular cases, will be found in the volume. Suffice it here to say that the results have been favourable enough to discountenance the prevalent idea of the incurability of tic, and to prove that persistence in treatment, as has been demonstrated in many other neuroses, will assuredly be crowned with success. Common misconception represents therapeutics as helpless in the presence of nervous disease; but if the doctor may count on the collaboration of his patient, he has no right to despair.

I should like, in closing, to be allowed to praise the authors' production; but I can do so only under great

reserve, for after so many years of co-operation I can no longer distinguish the work of MM. Meige and Feindel from my own. I think, however, that from many points of view the book which they have written is a most useful one.

E. Brissaud.

# AUTHORS' PREFACE

OUR object in publishing these studies has been twofold: first, to make known various facts of clinical observation, which will always possess at the least an intrinsic value; secondly, to endeavour to assign to the tics their due place among the numerous motor affections consequent on nervous or mental disease. With this end in view we sought to free ourselves of preconceived notions, avoiding at the same time the other extreme of eclecticism. Independently we have been led to adhere to the doctrine hallowed by the authority of Charcot, and since advocated by Professor Brissaud—a doctrine that seems to us to be in harmony with accepted clinical data.

We have thought it advisable to indicate, by the way, more than one misconception whose perpetuation is but a stumbling-block in the path of progress.

Since the eighteenth century the word *tic* has faced the perils of definition many a time, and has as often all but succumbed. The limits of its application have been alternately enlarged and narrowed to an excessive degree; its original signification has been so obscured that the inclination to-day is either to hesitate in the use of the word at all, or to employ it indiscriminately through ignorance of its real meaning. But if its interpretation be not specified, everything that is said

or written on the subject will remain fatally open to dispute. Want of precision in words leads inevitably to confusion of ideas and endless misunderstanding. In this respect the word tic is a great culprit; its promiscuous use implies looseness in its connotation—a fruitful source of controversies which, when all is said and done, are nothing more than regrettable quid pro quos. On fundamental points there is almost complete unanimity of opinion; any divergence is purely superficial, and to be ascribed to disagreement in terms.

Hence it has seemed to us essential to adopt a vocabulary, and to employ any term only after clearly particularising the sense we attribute to it. Our verbal conventions will not meet with universal acceptance, it may be, but we shall be the first to abandon them if common consent assign to the expressions that replace them the exact shade of meaning we meant to convey.

Our work will not be superfluous if we succeed in allotting to the word a definite position in medical terminology, or if any information we have amassed prove of service to future observers. And should we be enabled to demonstrate how unmerited is the reputation the tics enjoy of being irremediable, how they may, on the contrary, be mitigated and sometimes even cured under appropriate treatment, the practical value of the conclusion will, we hope, justify the importance we have attached to the subject.

# NOTE BY THE TRANSLATOR

OWING to the kind co-operation of M. Meige, it has been possible to embody in this English version of *Les tics et leur traitement* his latest definitions and views, as expressed in his monograph *Les tics* (July, 1905). The passages thus derived are enclosed in brackets. In the making of the translation some of the clinical cases have been slightly abridged, and one or two omitted. The Bibliography has been revised, largely supplemented, and brought up to date. In a short Appendix reference is made to various matters in regard to tic on which discussion has recently centred, subsequent to the publication of Meige and Feindel's book. Indices of names and of subjects have been added.

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# TICS AND THEIR TREATMENT

## CHAPTER I

### THE CONFESSIONS OF A VICTIM TO TIC

AT the time when the plan of our book was being sketched we decided to introduce the subject with several characteristic clinical documents, since it appeared to us indispensable to preface our definitions with an illustration of the type of affection and of patient that we had in view. The choice was rather bewildering at first; but towards the close of 1901 one of us was put into communication with an individual who is a perfect compendium of almost all the varieties of tic, and whose story, remarkable alike for its lucidity and its educative value, forms the most natural prelude to our study. The history is neither a fable nor an allegory, but an authenticated and impartial clinical picture, whose worth is enhanced by no less genuine facts of self-observation.

O. may be said to constitute the prototype of the sufferer from tic, for his grandfather, brother, and daughter have all been affected, and he himself has not escaped. His grandmother and grandfather were first cousins, and the latter, in addition to being a stammerer, developed tics of face and head; his brother stammers too, while both his sister and his daughter have facial

tics, and one of his sons was afflicted with asthma as a youth. The family history therefore more than confirms the existence of a grave neuropathic heredity, an unfailing feature in cases of tic.

O.'s fifty-four years lie lightly on him. His physique and general health are excellent, and devotion to bodily exercise and outdoor sports has enabled him to maintain a vigour and an agility above the average; nor is his intellectual activity any less keen.

His earliest tics—simple facial grimaces and movements of the head—made their appearance when he was eleven years old; notwithstanding, his recollection of their mode of onset is very exact.

I have always been conscious of a predilection for imitation. A curious gesture or bizarre attitude affected by any one was the immediate signal for an attempt on my part at its reproduction, and is still. Similarly with words or phrases, pronunciation or intonation, I was quick to mimic any peculiarity.

When I was thirteen years old I remember seeing a man with a droll grimace of eyes and mouth, and from that moment I gave myself no respite until I could imitate it accurately. The rehearsals were not prolonged, as a matter of fact, and the upshot was that for several months I kept repeating the old gentleman's grimace involuntarily. I had, in short, begun to tic.

In my fifteenth year I was at school with two boys whose hair was rather long, and who had acquired the habit of tossing it back by an abrupt shake of the head. It is true I cannot recollect endeavouring to ape this, but in any case it was at the same time that I found myself exhibiting an identical gesture, and I have little doubt it is the source of one of the tics from which I suffer at present.

I enlisted at the commencement of hostilities in 1870, and had already begun my military instruction, when a personal review of the company was made by a new colonel. As he passed he came to a sudden halt before me, and proceeded to harangue me on my far from military bearing; but his invective had no other effect than to aggravate my facial contortions, and the affair might have proved serious enough for me had not my captain come to the rescue and explained the involuntary nature of the spasms. The colonel, however, would have none of them and after a fortnight's sojourn in hospital I was discharged for "choreic movements of the face."

O.'s tics were at the first confined to the eyes and lips, but others were not long in appearing. He happened to be out one day for a walk with his sister during a snowstorm, and a flake entering his nostril made him sneeze and sniff half a dozen times. Long after the snow had ceased falling and the tickling sensation had vanished he repeated the performance, till it passed into a sniffing tic that continued for some months. His sister thoughtlessly set herself to mimic him, and speedily evolved an identical tic, which still persists.

In their turn, neck and shoulders were implicated in the affection. The most inveterate of all his tics is a somewhat complex twist of the head, whereby the occiput is depressed jerkily, and the chin advanced and elevated, occasionally to the right, though more commonly to the left. Such is the clonic form of the tic, at once frequent and obvious; but it may assume a tonic form, distinguished by an almost permanent retrocollic displacement of the head, the chin being carried in the air.

If, now, we approach these tics in greater detail, we notice, first of all, a blinking tic, more marked on the left side. Apart from abrupt and intermittent contractions of the orbicularis, which close the eye completely and wrinkle the skin in the neighbourhood, the same muscle sometimes passes into a state of tonic contraction, whereby the eye remains only half open, while the rest of the face is in repose, and so continues for a minute or more. Frontal and eyebrow tics also are frequently to be remarked.

Of his own accord O. has supplied us with a pathogenic and etiological analysis of these tics, which for accuracy and insight is truly astonishing.

A large number of my head and face movements owe their origin to the annoyance caused me by my seeing the tip of my nose or of my moustache from time to time. The former organ appears to make a

sort of screen in front of me, to avoid which I turn or raise my head : I can now see the object I am facing, but at the same time, naturally, I see my nose again at the side, whence one more tilt of the head, and so on. I am well enough aware how nonsensical all this is ; but it fails to deter me from my desire of playing at hide-and-seek with my nose. It is for an identical reason that each moment finds me blinking one eye or the other, or both ; I wish, and yet I do not wish, to see my nose, and so I bring my hand up to cover my face. Vain delusion ! for if I conceal my nose thus, it is my hand I see next, and I escape from Scylla to fall into Charybdis !

Here, then, is a tic springing from an ordinary visual impression. Any one can see the point of his nose if he wishes, but it does not come in his way should he be looking at something else; whereas our patient divides his attention between the end of his nose and the object of his regard, and his volatile will passes lightly from one to the other, incapable of concentrating itself on either. Force of repetition changes the voluntary act into an automatic habit, the initial motive for which is soon lost; and the patient shows the weakness of his character by making little or no effort at inhibition.

Resort to a pince-nez, in view of advancing age, has contributed materially to the elaboration of a host of absurd jerky movements, from which more tics have been recruited.

No sooner have I put on my pince-nez than I long to alter its position in innumerable ways. I must needs push it down or raise it up, must set it farther on or farther off ; sometimes I tax my ingenuity in attempts to displace it by tossing my head. Instead of looking tranquilly through the glasses, my eye is continually attracted by the rim, some point on which I try to focus or to get into a line with the object at which I am gazing. I want to see the object and the pince-nez at the same time ; as soon as I no longer see the former I wish to see it again, and similarly with the latter. My tics upset my pince-nez, and I have to invent another tic to get it back into place. The absurdity of this vicious circle does not escape my observation, and I know I am its author, yet that cannot prevent my becoming its victim.

When the pince-nez is not in use I toy with the spring or with the

cord, and a day seldom passes without my breaking the one or the other. As I wear spectacles at home one might suppose their relative stability would check my tricks; but their pressure on my temples and ears only serves to provoke fresh movements in a search for comfort.

And so the thing goes on. I was perfectly well aware of it at first, and was wont to imagine it was remediable; eventually, however, these grimaces of mine took place without any attention on my part, and then in spite of it, and I was no longer their master. There seem to be two persons in me: the one that tics, the son of the one that does not, is an *enfant terrible*, a source of great anxiety to his parent, who becomes a slave to his caprices. I am at once the actor and the spectator; and the worst of it is, the exuberance of the one is not to be thwarted by the just recriminations of the other.

In his accidental discovery of a "crack" in his neck originated other tics. As a matter of fact, these "cracks" do exist, and can be heard at a little distance; but it always requires a brisk toss of the head to elicit them. This is O.'s account of their evolution:

One day as I was moving my head about I felt a "crack" in my neck, and forthwith concluded I had dislocated something. It was my concern, thereafter, to twist my head in a thousand different ways, and with ever-increasing violence, until at length the rediscovery of the sensation afforded me a genuine sense of satisfaction, speedily clouded by the fear of having done myself some harm. The painlessness of the "crack" induced me to go through the same performance many and many a time, and on each occasion my feeling of contentment was tinged with regret: even to-day, notwithstanding that I ought to be persuaded of the harmlessness of the occurrence and the inanity of the manœuvre, I cannot withstand the allurement or banish the sentiment of unrest.

One could not desire a more lucid exposition of the pathogeny of so many of these head-tossing tics. The fundamental importance of the psychical element that precedes the motor reaction, with the secondary psychical reaction in its turn, the impulse to seek a familiar sensation, and the illogical interpretation of it under the influence of a tendency to nosophobia, are all admirably illustrated in O.'s description.

In addition to such "cracks" as are perceptible to others, O. is conscious of various bizarre subjective sensations that he refers to the same region—"bruised," "dragging," "crackling" feelings, not at all dolorous, to which he devotes an inordinate share of his attention. There is nothing abnormal about these, of course; not only may we notice them in ourselves, but, with a little effort, we may even reproduce them. Our indifference to their presence is the exact opposite of the interest they arouse in the patient's mind; his fickle will is, for no adequate motive, concentrated on a commonplace event, and on this slender basis delusions are fostered and tics are shaped.

The insight into the close association between the state of the mind and the development of tic yielded by a study of the foregoing narrative will enable us to appreciate the perspicacity of what follows:

> I suppose that we who tic make a great number of voluntary movements with the deliberate purpose of withdrawing attention from the tics we already exhibit; but step by step they become so habitual that they are nothing less than fresh tics appended to the old. To dissemble one tic we fashion another.
>
> Certain objects become for us what might be called *para-tics*. Such, for an instance, is my hat. I used to imagine I could mask all my oddities by tilting it on my head. I used to carry it in my hand, and play with it in every conceivable manner—to the advantage of the hatter solely, for it did not last me more than six weeks. . . . We are our own physicians at first: the discomfort of a tic is an urgent reason for our seeking to compass its overthrow.

For years it was O.'s custom when out walking to clasp his hands behind his back, bend his body forward, and hold his chin in the air, and this habit explains his attitude tic of to-day. The ludicrousness of it was early impressed on him, but instead of adopting the obvious solution of the difficulty, he proceeded to devise a whole series of intricate measures to regain the correct position—measures which he

picturesquely names *para-tics*. At first he used the curved handle of his cane to pull on the brim of his hat, and so depress his head; a subsequent modification consisted in putting the cane under his chin and pressing down on it. Each of these subterfuges attained a degree of success, and that in spite of the fact that in one case the extensors, and in the other the flexors, of the head were being resisted: in other words, each was efficacious so long as O. chose to consider it so.

Eventually their serviceableness dwindled, and O. conceived the plan of slipping his cane between his jacket and his buttoned overcoat so that the chin might find support against its knob. In the movements of walking, however, contact between the two was never maintained—each was for ever seeking the whereabouts of the other; and while it mattered little that this incessant groping and jockeying wore out several suits and the lining of several overcoats, the more serious result was the acquisition on O.'s part of the habit of making various up-and-down and side-to-side movements of his head, which continued to assert themselves, though chin and cane were no more in proximity.

It was not long ere the ceaseless intrusion of his head tics drove him every moment in search of a support for his chin. To read or write he was forced to rest it on a finger, or on his fist, or hold it between two fingers, or with his open hand, or with two hands, although the distraction provided by a serious occupation sufficed to banish the impulse and stay the tics.

A day came when application of the hand no longer seemed calculated to ensure immobility of the head, whereupon he hit on the idea of sitting astride a chair and propping his chin against it. This idea had its day, and the next move was to press his nose

against one end of the chair back. Each successive stratagem was of marvellous promise at the outset, but its inhibitory value rapidly deteriorated and new plans were concocted.

All schemes for fixation lose their virtue through time, but they may be abandoned for other reasons, one of the principal of which is the development of pain. By dint of rubbing or pressing his nose or his chin on the knob of his cane and the back of his chair, O. has produced little excoriations and sores on the parts concerned, the pain of which acts as a deterrent, but his tics and para-tics break out afresh whenever it has gone. The game has been carried to such an extent that under the chin and at the root of the nose there have appeared actual corns—strange stigmata of one's "profession."

The details in the mental process are similar to what has been already noted:

It was the craving to keep my head in a correct position that induced the habit of leaning my chin on something, and I found it essential to feel the contact; familiarity, however, soon ended in my failing to perceive it, and a new movement was made that I might experience the sensation once more. And so on the ball rolled, till augmentation of the force I exerted, under a constant incitement to feel something more or something else, resulted in the formation of callosities on nose and chin.

In this way factitious wants come into being, which may be described as a sort of *parasitic function* of which the patient is alike the creator and the dupe.

O.'s therapeutic ingenuity, however, could not rest satisfied except when some fresh contrivance was being put to the test. Needless to say, at one time he experimented with the stiff collars affected by some sufferers from mental torticollis.

At the commencement I used to wear collars of medium height, though not wide enough to admit my chin. An attempt to obviate

the difficulty by unbuttoning my shirt and bending my head down so as to keep my chin in the opening proved abortive, owing to the weakness of the resistance, so I purchased much higher and stiffer ones, in which I buried my lower jaw and prevented its moving at all. The success of this method was transitory, nevertheless, for however stiffly they were starched, the collars invariably yielded in the end and presented a lamentable aspect. I next happened on the fatuous plan of attaching a string to my brace buttons, and passing it up under my waistcoat to connect it with a little ivory plate that I held between my teeth, its length being so arranged that in order to seize the plate I had to lower my head. Admirable idea! I soon was forced to abandon it, however, for my trousers were pulled up on the right in a way that was as grotesque as it was uncomfortable. I have always had a weakness for the principle of the thing, nevertheless, and even to-day as I go down the street I sometimes catch hold of the collar of my jacket or vest with my teeth and stroll along in this way. At home it is the collar of my shirt that acts as my tether.

The retrocollic attitude that O. favours seems to have had the further effect of making him forget how to look down. There is no impairment of any of the eye movements, but he has considerable trouble in directing his gaze downwards, and if with his head in the normal position he holds a book below the level of the plane of his eyes, reading is more arduous, and after a little time impossible. Yet there is no indication whatever of ocular paresis; it is rather a sort of apprehension from which he suffers. On several occasions we have remarked a synergy of function, head and eyes moving upward in unison.

Our patient's category of tics is not yet exhausted, however. He has been afflicted with a shoulder tic, consisting of simultaneous or alternate elevation, sometimes of other movements, and always with some abduction of the arms. Frequent execution of these actions has culminated in the acquisition of the faculty of voluntarily producing a rather loud "crack" in the shoulder articulations, which thus not merely originated

in a tic, but supplies an ever-active stimulus for its reproduction; in its occurrence satisfaction and dissatisfaction are blended as before. At the present moment the impulse to this particular tic is in abeyance, and he has ceased to take any interest in the "crack," considering it a trivial society accomplishment of no significance or danger, analogous to voluntary subluxation of the thumb, or to the curious sounds that some people are fond of making by way of diversion.

Again, O. has been a martyr to a leg tic of several months' duration. When he was on his feet, he learned to strike his right heel against his left ankle, wearing his trouser through in no time, and ceasing only with the development of a painful wound over the bone. Once it was healed, however, came the deliberate search for the sensation again, and the pleasurable feeling in its rediscovery.

In O.'s case the inhibitory influence of the will on his tics is abundantly manifest. Should he find himself in the company of one from whom he would fain conceal his tics, he is able to repress them completely for an hour or two, and similarly if he is deep in an interesting or serious conversation. Nevertheless, the desire to let himself go obtrudes itself again, and if he can refrain no longer he will invent any pretext for leaving the room, abandoning himself in his moment of solitude to a veritable debauch of absurd gesticulations, a wild muscular carnival, from which he returns comforted, to resume sedately the thread of the interrupted dialogue.

O. is fond of cycling, and while at first the attention that the necessary co-ordination of hands and feet demanded proved an effective barrier in the way of his tics, now that he can maintain his equilibrium automatically his head assumes its favourite attitude of posterior displacement. His devotion to a game of

billiards, or to such exercises as fencing or rowing, is never interfered with by an unruly tic. He is a great fisher, and when he "has a bite," or is expecting one, he will remain motionless indefinitely; his tics do not hinder him from preparing his bait with the minutest care. But let his interest in his prospective catch fade, let the fish be disinclined to "take," and there will be a renewal of the movements.

In his sleep they one and all disappear. The mere assumption of a horizontal position, however, no longer suffices to bridle them, and before dropping off to sleep he passes many a minute in seeking comfort. The rubbing of his head on the pillow, the rustling of the clothes, disturb and exasperate him, and he turns in this direction and that for relief; yet should he hear or feel nothing, he will change about once more in the search for a sensation or a sound. Thus has it come about that to procure slumber he has adopted the extraordinary plan of lying at the very edge of the bed and letting his head hang over.

The series is not yet at an end.

O. exhibits a tic of the inferior maxilla. He protrudes and retracts his jaw alternately in his endeavour to elicit cracking noises from his temporo-maxillary articulations. At one time his hands used to join in the fray, the goal being to overcome the masseters and effect a sort of dislocation. A biting tic ensued. One day O. was alarmed to discover two dark patches on the internal aspect of the cheeks, but was reassured on learning from his sister—whose proclivities lay in a similar direction—that she had noticed the same in her own case, and that it was the result of constant nibbling at the buccal mucous membrane.

Nor was this the solitary biting tic. Formerly

a pencil or a pen-holder used to be unrecognisable at the end of twenty-four hours, and the handles of canes and umbrellas suffered as well. To obviate the nuisance he entertained the unfortunate idea of using metal pen-holders and carrying silver-mounted walking-sticks; but his teeth failed to make any impression on the objects, and began to break in consequence. The irritation produced by a small dental abscess proved an additional source of mischief, for he developed the habit of trying, with finger, cane, or pen-holder, to shake the teeth in their sockets, and was finally compelled to have the incisors, canines, and first molars drawn. Then he ordered a set of false teeth—a move that afforded a new excuse for a tic. Every moment the set was in imminent risk of being swallowed, so vigorously did his tongue and lips assail it. Fortunately such an accident has never occurred, although he has already broken several sets. Sometimes he would be seized with an insane impulse to take his teeth out, and would invent the flimsiest pretext for retiring; the set would then be extracted and immediately reinserted, to his complete satisfaction and peace of mind.

An infinite variety of scratching tics must be added to the number. He has also a tic of phonation dating back to his fifteenth year. His custom was, when learning his lessons at school, to punctuate his recital of them with little soft expiratory noises that may still be distinguished to-day among a host of other tics. The following is his proffered explanation of the pathogeny of this "clucking" tic:

> We who tic are consumed with a desire for the forbidden fruit. It is when we are required to keep quiet that we are tempted to restlessness; it is when silence is compulsory that we feel we must talk. Now, when one is learning his lessons, conversation is prohibited, the natural consequence being that he seeks to evade the galling interdict by giving vent to some inarticulate sound. In this fashion did my "cluck" come

into being. Moreover, we abhor a vacuum, and fill it as we may. Various are the artifices we might employ—such, for instance, as speaking aloud; but that is much too obvious, and does not satisfy: to make a little grunt or cluck, on the other hand—what a comfort in a tic like that!

We need not smile at these explanations, for they are corroborated by the facts of clinical observation. Fear of silence is nothing else than a form of phobia, comparable to the fear of open spaces.

O.'s account of the origin of his tics supplies further evidence of the mental infantilism of those with whom we are at present concerned. It is the prerogative of "spoilt children" to wish to do exactly what they are forbidden to do. They seem to be animated by a spirit of contrariness and of resistance; and if in normal individuals reason and reflection prevail with the approach of maturity, in these "big babies" many traces of childhood persist, in spite of the march of years.

In the strict sense of the words there never has been any echolalia or coprolalia in O.'s case, though it has happened that expressions lacking in refinement have escaped him; but he never has been consciously yet irresistibly urged to utter a gross word. The sole vestige of anything of the kind is a sort of *fruste* coprolalia that consists in an impulse to use slang—an impulse which he cannot withstand and which he finds consolation in obeying.

Some additional details may be submitted to illustrate the intimate analogies between tics and obsessions.

O. is a great cigarette smoker, and with him the call to smoke is inexorable. It is not so much, however, the effects of the narcotic for which he seeks as the sum of the sensations derived from the act —the rustling of the tobacco in the paper, the crackle

of the match, the sight of the cloud of smoke, the fragrance of it, the tickling of nose and throat, the touch of the cigarette in the fingers, or between the lips —in a word, a whole series of stimuli, visual, auditory, olfactory, and tactile, whose habitual repetition gradually introduces into the act of smoking an automatic element that brings it into line with the tics. The suppression of this parasitic function commonly produces a feeling of the utmost discomfort; inability to indulge in it causes the keenest anguish. More agonising than the actual impossibility of smoking is the idea of its being impossible. Hence it is that O. lights cigarette after cigarette, taking a few whiffs at each and throwing them aside scarce touched, or leaving them here, there, and everywhere. The dose is immaterial; it is the rehearsal of the act he finds so soothing.

In regard to his taste for liquor a similar description might be given. The intoxicating effect of any beverage had little attraction for him; it was the drinker's gesture and the numerous accompanying sensations that he sought to renew. Any form of drink, therefore, served to gratify his desire; in other words, his behaviour revealed a phase of dipsomania rather than a stage of alcoholism. For that matter, the development of symptoms of alcoholic poisoning proved a blessing in disguise, since they reinforced the inhibitory power of the will, and enabled it to abort a sensori-motor habit that had wellnigh become established.

No objective alteration in cutaneous sensibility in any of its forms is discoverable on examination of O., but he bewails a long array of subjective sensations, painful or disagreeable as the case may be. Certain abdominal pains in particular occupy his thoughts: after being in bed about an hour he begins to suffer from pain in the abdomen and across the kidneys, so acute that he is forced to rise and walk

about his room, or sit on one chair after another; at length it moderates enough to allow return to bed and permit of sleep. During these crises there is no sign of any local pathological condition, no distention or tenderness or evacuation of the bowel. They usually last for some days at a time and disappear suddenly, as when, after several nights' and days' uninterrupted suffering, his pains vanished as by an enchanter's wand once he set foot on the boat that was to take him to England.

We have had the opportunity of observing our patient in the throes of one of these attacks, and while we did not doubt the genuineness of his sufferings, we could not but be struck with the dramatic exuberance of his gestures. He wriggled on his chair, unbuttoned his clothes, undid his necktie and his collar, pressed his abdomen with his hands, sobbed and sighed and pretended to swoon away. Such excessive reaction to pain is characteristic of a nervous and badly trained child, not of a man of his years. Notwithstanding his humiliation at these exhibitions of weakness, he can no more control them than he can his ordinary tics; in fact, the tics run riot during the crises of pain.

On several occasions the reflexes have been the object of examination. The pupillary reactions are normal, as are the tendon reflexes of the upper extremity; but the knee jerks are much diminished, and one day we failed to elicit them at all, though we noted their return a week later. A careful search for further signs of possible cerebro-spinal mischief proved negative, if we except a slight flexion of the knees when walking and a tendency to a shuffling gait.

Notwithstanding this absence, in O.'s case, of any definite indication of organic disease, we cannot afford,

in our examination of patients, to overlook any symptom, however fleeting or trivial it may appear, since it is only by painstaking investigation both on the physical and the mental side that we can ever hope to determine the characters and fathom the nature of the affection, apart from the value of such an investigation as an aid to diagnosis, prognosis, and treatment.

With charming spontaneity and frankness, but critically withal, O. has furnished us with a picture of his mental state. Nothing could be truer or more instructive than this piece of self-observation, even though his obvious pleasure in hearing himself talk is a little weakness of which, to tell the truth, he is the first to accuse himself:

> In childhood and at school my accomplishments were ever on the same dead level of mediocrity. I was neither brilliant nor backward; in the drawing-room or in the playground, I was good at everything without excelling in anything; the astonishing facility with which I learned to sing, play, draw, and paint, was linked with inability to distinguish myself at these pursuits.
>
> Each new study, each new game, attract and captivate me at first, but I soon tire of them, and once a fresh enterprise has taken their place, indifference to them changes to disgust. If I am amused with a thing, I do it well; if bored, I throw it aside. I suppose it is characteristic of people who tic to be fickle and vacillating.

The versatility which is so fundamental an element in O.'s nature has not been prejudicial to his business career. He has managed and still manages important commercial undertakings, demanding initiative and decision, and, so far from sparing himself in any way, he has exhibited a combination of caution and audacity that has stood him in good stead. It is more especially in the conduct of urgent operations that his alertness is displayed. His comprehensive grasp of the situation enables him to put his machinery at once into action,

with eminently satisfactory results, if we judge by his prosperous and assured position.

His mobile and impulsive temperament is revealed in his every deed, but he shows at the same time a curious disposition to alternate between the pros and the cons of a question. It is the outcome of his extremely analytical and introspective mind.

I find myself seeking a knot in every bulrush. I experience a sensation of pleasure only to tax my ingenuity in discovering some danger or blame therein. If a person produces an agreeable impression on me, I cudgel my brains in the attempt to detect faults in him. I take it into my head to ascertain how anything from which I derive enjoyment might become an aversion instead. The absurdity of these inconsistencies is perfectly patent to me, and my reflections occasion me pain ; but the attainment of my ends is accompanied with a feeling of pleasure.

In regard to my tics, what I find most insupportable is the thought that I am making myself ridiculous and that every one is laughing at me. I seem to notice in each person I pass in the street a curious look of scorn or of pity that is either humiliating or irritating. No doubt my statement is a little exaggerated, but my fellows and I have an overweening self-conceit. We wish to be ignored, and yet we wish to be considered ; it is annoying to be the object of sympathy, but we cannot bear to become a laughing-stock. Accordingly our goal is the dissimulation of our failing by any means feasible ; yet nine times out of ten our efforts are abortive simply because we invent a tic to hide a tic, and so add both to the ridicule and the disease.

Alike in speaking and in writing O. betrays an advanced degree of mental instability. His conversation is a tissue of disconnected thoughts and uncompleted sentences ; he interrupts himself to diverge at a tangent on a new train of ideas—a method of procedure not without its charm, as it frequently results in picturesque and amusing associations. No sooner has he expressed one idea in words than another rises in his mind, a third, a fourth, each of which must be suitably clothed ; but as time fails for this purpose, the consequence is a series of obscure ellipses which are often captivating by their very unexpectedness.

His writing presents an analogous characteristic.

It has often happened that I have commenced a business letter in the usual formal way, gradually to lose sight of its object in a crowd of superfluous details. Worse still, if the matter in hand be delicate or wearisome, my impatience is not slow to assert itself by remarks and reproaches so pointed and violent that my only course on reperusal of the letter is to tear it up.

By way of precaution, therefore, O. has adopted the plan of having all his correspondence re-read by his colleague. Strangely enough, to his actual caligraphy no exception can be taken. The firmness of the characters, the accuracy of the punctuation and accentuation, the straightness of the lines, are as good as in any commercial handwriting.

With the aggravation of his head tics writing has become a serious affair. Every conceivable attitude has been essayed in turn, and at present the device he favours is to sit across a chair and rest his chin or his nose on the back; in this fashion he can write all that is required.

O.'s every act is characterised by extreme impatience. In his hurry he comes into collision with surrounding objects or breaks what he is carrying in his hand, not because of defective vision or incoordination of movement, but because of his eagerness to be done.

In spite of the fact that I know my recklessness to be absurd, that I see well enough the obstacles around and the danger of an encounter, I am conscious of a paradoxical impulse to do exactly what I should not do. In the same instant of time I want what I do not want. As I pass through a door I knock against the door-post without fail, for the sole reason that I would avoid it.

There is impatience in his speech. His volubility makes him cut short his own phrases or break in upon the conversation of others. If an idea suggests

itself, he must give it expression. Perhaps the word wedded to the idea is not at once forthcoming, yet he does not hesitate to invent a neologism, which is often amusing in spite of or because of its oddness, and if it please him he will enter it in his vocabulary and use it in preference to the other.

To wait is foreign to his nature. The least delay at table exasperates him; any order he gives must be executed instanter; no sooner has he set out than he would be at his journey's end. An obstruction or difficulty in the way is the signal for a fresh outburst; his irritation soon exceeds all bounds; his language degenerates into brutality, his gestures become increasingly violent and menacing.

It is not with any surprise, then, that we learn in O.'s case of incipient homicidal and suicidal ideas.

> At times when my tics were in full force evil thoughts have often surged over me, and on two or three occasions I have picked up a revolver, but reason fortunately has come to the rescue.

As a matter of fact, the suicidal tendencies of some sufferers from tic are seldom full-blown. The will is too unstable to effect their realisation. Hence the patient's hints at doing away with himself are nothing more than empty verbiage. Similarly with the inclination to commit homicide, it vanishes as soon as it arises.

The term "vertigos" is used by O. to designate a long series of little "manias" or obsessional fears from which he suffers, among which may be enumerated dread of passing along certain streets and a consequent impulse to walk through others; dread of breaking any fragile object he holds in his hands, coupled with the temptation to let it fall; fear of heights, and at the same time a desire to throw himself into space.

I have often stood on the edge of the pavement waiting for a vehicle to pass, and at the moment of its approach darted across just under the horse's nose. On each occasion I have been conscious equally of the absurdity and yet of the irresistibility of the idea; each time the attempt to withstand it has been labour lost.

O. is a great nosophobe. At one time he was immoderately apprehensive of contracting hydrophobia, and used to flee from the first dog he saw. To his sincere regret he had several of his pet dogs killed, because of his conviction that they would become infected, although he felt such harsh measures to be quite unjustifiable. At a subsequent stage he turned syphilophobe for no adequate reason. He was alarmed lest a minute pimple on his chin should develop into a chancre. Recently his chief misgiving has been that he may become ataxic or demented.

Among his various afflictions mention must be made of an umbilical hernia, supposed to have originated in the chafing of his umbilicus by a belt he was wearing during a long spell in a canoe. As a matter of fact, the hernia is purely imaginary—at any rate, there is no trace of it to-day. Yet at the first it bulked very largely in his mind, and he is still fully persuaded of its reality, though no longer of its gravity.

O. further complains of all sorts of noises in his ears, but these are simply the ordinary sounds that one can produce in the middle ear by clenching the jaws together. He will not accept so obvious an explanation, however, preferring to regard them as indubitable evidence of the "lesion" with which he is pre-occupied. The tinnitus, therefore, is rather of the nature of an illusion than of a hallucination.

He is distinctly emotional, and lives at the mercy of his emotions, but from their very bitterness he contrives to derive some pleasure. His passion for

horse-racing is not due to the fascination of the sport, but to a bitter-sweet sensation which the excitement of the scene calls into being. He is indifferent to arrest or aggravation of his tics; all that he seeks is the association of a certain sense of anguish with certain "tremolos in the limbs," wherewith he is greatly delighted.

In the domain of his affections there does not appear to be any abnormality. O. is an excellent paterfamilias, adoring his children, but spoiling them badly at the same time. In this part of our examination we did not press for details, but as far as we have gathered he is capable of sympathies keenly felt though rarely sustained.

Thus, whatever be the circumstances, changeableness, versatility, want of balance, are manifested clearly in all his mental operations; and when he remarks himself on the youthfulness of his disposition, he is simply stating a truism as far as those who tic are concerned, for, in spite of the advance of years, their mental condition is one of infantilism.

Under our direction O. has devoted several months to the eradication of his tics, and he has not been slow to appreciate the aim of the method or to acquire its technique. One of the first results was the repudiation of various procedures more harmful than otherwise, and the successful endeavour to maintain absolute immobility for an increasing space of time. The outcome of it all has been a gradual diminution of the tics in number, frequency, and violence, and a corresponding physical and mental amelioration.

We do not intend in this place to enlarge on the details of our treatment: suffice it to say that it consisted in a combination of Brissaud's "movements of immobilisation" and "immobilisation of movements"

with Pitres's respiratory exercises and the mirror drill advocated by one of us. To-day the utility of these measures is an accepted fact; but at the same time we rely on an inseparable adjunct in the shape of mental therapeusis, seeking to make the patient understand the rationale of the discipline imposed.

Our task has been lightened to an unusual degree through O.'s intimate acquaintance with the beginnings of his tics and his striking faculty of assimilation. On many occasions he has anticipated our intentions and of his own accord outlined a programme in harmony with the indications we were about to give him. Thanks to this happy combination of circumstances, the improvement effected by our treatment has been quickly manifested.

I am conscious of very material gain. I do not tic so often or with such force. I know how to keep still. Above all, I have learned the secret of inhibition. Absurd gestures that I once thought irrepressible have succumbed to the power of application; I have dispensed with my *para-tic* cane; the callosities on my chin and nose have vanished; and I can walk without carrying my head in the air. This advance has not been made without a struggle, without moments of discouragement; but I have emerged victorious, strong in my knowledge of the resources of my will. . . . To tell the truth, at my age I can scarcely hope for an absolute cure. Were I only fifteen, such would be my ambition; but as I am, so shall I remain. I very much doubt whether I shall ever have the necessary perseverance to master all my tics, and I am too prone to imagine fresh ones; yet the thought no longer alarms me. Experience has shown the possibilities of control, and my tics have lost their terror. Thus have disappeared half my troubles.

The same sagacity that O. displayed in analysis of his tics has enabled him to grasp the principles of their subjugation. Notwithstanding that his guarded prognosis is evidence for his appreciation of the hindrance his peculiar mental constitution is to a complete cure, he has impartially put on

record his definite progress towards health of body and mind.

Such, then, is the faithfully reported story of our model, such are his confessions.

During ten years' intercourse with sufferers from tic it has been our interest to analyse and reconstruct the pathogenic mechanism of their symptoms, and in the vast majority of cases it has been possible to determine the origin of the tics and to confirm the association with them of a peculiar mental state. We have thus been able to supplement earlier and weighty contributions to the subject by numerous suggestive instances, prominent among which is the case of O., whose spontaneous and impartial self-examination forms an invaluable clinical document. Its importance is enhanced by the fact that its observations are corroborated by a survey of other examples of the disease.

With commendable good-humour, keenness, and sincerity, O. has of his own accord plunged into the minutiæ of his malady, and exhibited a rare appreciation and precision in the scrutiny of his symptoms. The mere enumeration of them stamps the record as one of outstanding clinical importance, but it is the study of their pathogeny that is so fascinating. For a moment the doubt crossed our mind that O.'s explanations might be merely a reflex of information culled from scientific journals or of conversations with medical friends, but this is not so. He has been prevented by his profession both from cultivating a taste for and from devoting any leisure to psychological and physiological questions, while he evinces an actual antipathy to medical literature, fearful as he is of contracting disease. The point we are desirous of emphasising, therefore, is simply this: that the results

of O.'s voluntary and unprejudiced self-examination are in perfect harmony with the declarations of our older patients and with the statements of the majority of those that have made a special study of the tics. For these reasons we have taken O. as the prototype of the *tiqueur*.

## CHAPTER II

### HISTORICAL

WE have just become acquainted with an individual who may, we believe, be considered the type of a species, and have described all his tics. What is a tic, then?

Its etymology has not much information to furnish. The probability is that the word was originally onomatopœic, and conveyed the idea of repetition, as in tick-tack. *Zucken*, *ziehen*, *zugen*, *tucken*, *ticken*, *tick*, in the dialects of German, *tug*, *tick*, in English, *ticchio* in Italian, *tico* in Spanish, are all derivatives of the same root. It matters little, in fact, since the term is in general use and acceptable for its shortness and convenience. In popular language every one knows what is meant by a tic: it is a meaningless movement of face or limbs, "an habitual and unpleasant gesture," as the Encyclopædias used to say. But the definition lacks precision.

A glance at the history of the word will reveal through what vicissitudes it has passed. We need but remind the reader of its exhaustive treatment in the Dictionaries, and refer him for an elaborate bibliography to a recent work by R. Cruchet,[1] to which we shall have occasion to return.

There is no justification for regarding the *risus*

[1] René Cruchet, "Étude critique sur le tic convulsif et son traitement gymnastique," *Thèse de Bordeaux*, 1902.

*sardonicus* of the ancients as a tic. All that we can say is that the phrase apparently stood for a complex of facial "nervous movements," whether accompanied by pains and paralyses or not. Nor can the *rictus caninus* or the *tortura oris* have been other than spasms or contractures of the face.

Previous to its introduction as a technical term, the word *tique*, *ticq*, *tic*, was in current use in France, and applied in the first place to animals. In 1655 Jean Jourdin described the *tique* of horses. In eighteenth-century literature tic appears in the sense of a "recurring, distasteful act"—as expressed by the *Encyclopœdia*—especially in individuals revealing certain eccentricities of mind or character. This old-time opinion is worth remembering, particularly in view of latter-day theories.

Once adopted by the eighteenth-century physicians, the application of the word was extended in various directions. André (1756) was the first to mention *tic douloureux* of the face, an affection excluded to-day by common consent from the category of true tics. Simple, painless convulsive tic, spreading from face to arms, and to the body as a whole, was differentiated by Pujol in 1785-7. During the earlier half of the nineteenth century no solid progress was achieved by the work of Graves, François (of Louvain), Romberg, Niemeyer, Valleix, or Axenfeld. It is to the clinical genius of Trousseau that we owe the rediscovery of tic, the careful observation of its objective manifestations, and the recognition of accompanying mental peculiarities.

In spite of the fact that he considered it a sort of incomplete chorea, and classed it[1] nosologically with saltatory and rotatory choreas and with occupation

[1] TROUSSEAU, *Clinique médicale de l'Hôtel Dieu*, 1873, vol. ii. p. 267 *et seq.*

neuroses, Trousseau's original account remains a model of clinical accuracy:

> Non-dolorous tic consists of abrupt momentary muscular contractions more or less limited as a general rule, involving preferably the face, but affecting also neck, trunk, and limbs. Their exhibition is a matter of everyday experience. In one case it may be a blinking of the eyelids, a spasmodic twitch of cheek, nose, or lip; in another, it is a toss of the head, a sudden, transient, yet ever-recurring contortion of the neck; in a third, it is a shrug of the shoulder, a convulsive movement of diaphragm or abdominal muscles,—in fine, the term embodies an infinite variety of bizarre actions that defy analysis.
>
> These tics are not infrequently associated with a highly characteristic cry or ejaculation—a sort of laryngeal or diaphragmatic chorea—which may of itself constitute the condition; or there may be a more elaborate symptom in the form of a curious impulse to repeat the same word or the same exclamation. Sometimes the patient is driven to utter aloud what he would fain conceal.

The advantage of this description is its applicability to every type of tic, trifling or serious, local or general, from the simplest ocular tic to the disease of Gilles de la Tourette. Polymorphism is one of the tic's distinguishing features.

Apart from his studies in objective localisation, Trousseau, as we have seen, recognised that the tic subject was mentally abnormal, but the credit of demonstrating the pathogenic significance of the psychical factor is Charcot's. Tic, he declared,[1] was physical only in appearance; under another aspect it was a mental disease, a sort of hereditary aberration.

Advance along the lines thus laid down has been the work more especially of Magnan and his pupils, of Gilles de la Tourette, Letulle, and Guinon. A meritorious contribution to the elucidation of the question is the thesis of Julien Noir, written under the inspiration of Bourneville and published in 1893. The still more recent labours of Brissaud, Pitres, and Grasset

[1] CHARCOT, *Leçons du mardi*, 1887-8, p. 124.

in France, and of others elsewhere, have added materially to our knowledge.

Confining ourselves for the present to the discussion of the latest interpretations put on the word tic, we may be allowed the remark that if the influence of Magnan's teaching has been instrumental in making our idea of tic conform more to the results of observation, nevertheless his view is not without its dangers.

In the opinion of Magnan and his pupils, Saury and Legrain[1] in particular, the tics do not form a morbid entity; they are nought else than episodic syndromes of what Morel called "hereditary insanity," that is to say, of what is usually designated nowadays "mental degeneration."

Now, if by degeneration be meant a more or less pronounced hereditary psychopathic or neuropathic tendency which betrays itself by actual physical or psychical stigmata, then tic patients are unquestionably degenerates. If degeneration unveils itself in multifarious psychical or physical anomalies, the subjects of the tic are undoubtedly degenerates. If a degenerate may suffer from one or other variety of aboulia, or phobia, or obsession, the man with tic is a degenerate too.

Thus understood, the epithet may be applied to all individuals affected with tic. In fact, they *must* be degenerates, if the word is to be employed in its most comprehensive sense. But the explanation is insufficient, inasmuch as the converse does not hold good; all degenerates do not tic.

We may be safe in maintaining, then, that tic is only one of the manifold expressions of mental degeneration, but we are not much enlightened thereby. Obsessions and manias similarly are indications of mental deterioration, yet the fact conveys very scanty in-

[1] LEGRAIN, "Du délire des dégénérés," *Thèse de Paris*, 1885-6.

formation as to their real nature. Physical anomalies—ectrodactyly, for instance—betoken physical degeneration, no doubt; but are inquiries to cease with this categorical assertion? Such certainly was not the idea of those observers whose is the praise for having demonstrated the common parentage of the heterogeneous manifestations of degeneration. Synthesis cannot exclude the work of analysis, and in practice there is scarcely a case to which this doctrine is not pertinent.

Every physical and every mental anomaly is the fruit of degeneration; every individual who is a departure from the normal is a degenerate, superior or inferior as the case may be. As instances of the latter we may specify the dwarf and the weak-willed; of the former, the giant and the exuberant. This sane and comprehensive conception of the subject must command universal acceptance as a synthetic dogma, but it cannot supplant the description and interpretation of individual facts. However legitimate be our representation of tic as a sign of degeneration, it is obviously inadequate if we rest content with styling its subject a degenerate.

Unfortunately the inclination too often is to be satisfied with the term, and to imagine that therewith discussion terminates. Still more unfortunately, in concentrating their attention on the mental aspect of the disease, some have altogether lost sight of one of its fundamental elements, viz. the motor reaction, and have conceived the possibility of its occurrence without any *tic* at all. Cruchet actually postulates the existence of an exclusively psychical tic, with no external manifestation.

To these questions, however, we shall return. The present introductory sketch is intended merely to demonstrate the ease with which ambiguity arises, and the desirability of its removal. We are fully

conscious of the value of the work of Magnan and his school in emphasising a phase of the subject the exposition of which can only result in gain.

The investigation of the motor phenomena of tic is no less encircled with perplexities. Not only are the troubles of motility boundless in their diversity and correspondingly difficult to classify, but they also bear so close a resemblance to a whole series of muscular affections that one is tempted to describe a special symptomatology for each individual case.

For several years there has been, more especially outside of France, a manifest tendency to aggregate all convulsions of ill-determined type into one great class, under the name "myoclonus"; and into this chaotic farrago, it is to be feared, will tumble a crowd of conditions which should be studiously differentiated: the tics, electric and fibrillary choreas, paramyoclonus multiplex, etc., etc.

In the present state of our knowledge, according to Raymond,[1] we must be guided by the lessons of clinical experience, which teach us, first, that the varying modalities of myoclonus develop from the parent stock of hereditary or acquired degeneration; and, secondly, that transitional forms which do not fall into any of the received categories are of common occurrence.

From a general point of view, the deductions are entirely reasonable. There is a suggestive analogy between these conditions and the muscular dystrophies in the persistence with which their multiplicity seems to defy the efforts of classification. The analytic stage witnessed the rapid evolution of such clinical types as the facial, the facio-scapulo-humeral, the juvenile, the

[1] RAYMOND, *Clinique des maladies du système nerveux*, vol. i. 1896, p. 551.

pseudo-hypertrophic, not to mention others that bear the name of their observer; but it has been succeeded by the synthetic stage, whose function it is to incorporate all the former myopathies in the comprehensive group of "muscular dystrophy."

Yet here, again, peril lurks in too hasty a generalisation. To give the disease a name is not equivalent to pronouncing a diagnosis. The denominations "myoclonus," "muscular dystrophy," "degenerate," are alike inconvenient. Their scope is at once too inclusive and too exclusive. They may be indispensable; they are assuredly not sufficient.

The possibilities of misapprehension do not end here.

The manifestation of each and every tic—be it a flicker of the eyelid, a turn of the head, a cry, a cough—is through the medium of a muscular contraction. On the very nature of this contraction opinion is divided.

To its distinctive features of abruptness and momentariness is due the epithet "convulsive" habitually assigned it, but the qualification is not secure. Since the time of Willis the word convulsion has been employed in a double sense, to signify *clonic* muscular contractions (the "convulsion" of popular parlance) and *tonic* muscular contractions (a meaning attached to the term only by the scientist).

For our part, we can raise no valid objection to the specification of tics as convulsive, provided always that the existence of clonic convulsive tics and of tonic convulsive tics be recognised. As a matter of fact, clinical observation supplies instances of both sorts.

Nevertheless, attention has been confined by a majority of authors to the consideration of the former variety only, so much so that a whole order of facts which in derivation, essence, and external characteristics ought to be identified with the tics has been passed over in silence. Even on the assumption that the

proposal to recognise the two classes cannot be entertained, at the least it is advisable to predetermine the import of the word convulsion, and to speak of *clonic* convulsive tics. This is the formula of Ferrand and Widal in their article "Convulsion" in the *Encyclopædic Dictionary of the Medical Sciences.* Similarly, Troisier[1] says that the convulsive tic properly so called is characterised by clonic movements, in which opinion Erb and most German observers concur. Tonic tic appears to have been forgotten, and we have thought it our duty to resuscitate it.

Cruchet has quite recently approached the subject in a critical fashion:

> To extend the term tic to tonic spasms such as mental torticollis, mental trismus, or permanent blepharospasm, is singularly to outstep the limits of its significance. We believe Erb, Troisier, and Oppenheim are warranted in restricting convulsive tic to clonic convulsions, and the consequent simplification and elucidation of the question lead us to adopt the same view.

If it be solely a matter of terminology, and if universal consent reserve tic for convulsions whose expression is clonic, we shall be the first to withdraw the phrase "tonic tic," making the single proviso that some other designation be found for a condition which differs from the clonic tic only in its external features, and not in origin, pathogeny, or treatment.

What is this other name to be? Are these tonic muscular contractions to be regarded as synonymous with contractures? If so, do we mean myotetanic contracture—to utilise the excellent division imagined by Pitres—as in hysteria, or myotonic contracture, as in Parkinson's disease? The state of muscular contraction in tonic tic does not correspond accur-

[1] TROISIER, *Dictionnaire Dechambre*, art. "Face."

ately to either, though it is certainly more akin to the myotonic form; but myotonia is a sort of *caput mortuum* for the too facile classification of cases in reality difficult to place, and we are afraid the term is not calculated to ensure precision of ideas.

Should we be reproached with straining the primary meaning of the word tic by applying it to a contraction of a certain duration, we find ample justification ready at hand in the pages of Cruchet himself. "It was probably in 1656," he says, "that *tique* appeared in the French language, in the works of Jean Jourdin." Now, in the quaint description of the horse's *tique* given by that writer, the signs of the disease are said to be cocking of the ears, rolling of the eyes, clenching and gnashing of the jaws, stiffening of the tail, nibbling at the bit, etc. What else are these than persistent contractions or tonic tics, alternating or co-existing with jerking movements or clonic tics?

We have no desire, of course, to over-estimate the argumentative value of this passage, the interest of which is mainly historical; but we find ourselves wholly in accord with Cruchet when he remarks of the scientific distinction formulated by Willis, and again by Michael Etmüller, between continuous, permanent tonic convulsions, and intermittent, momentary clonic convulsions, that it is uninvolved, practical, and of universal applicability.

In 1768 certain tics were classified among the tonic convulsions by Boissier de Sauvages. Marshal Hall[1] gave an account of various tonic facial convulsions to which Valleix refers as non-dolorous tics or idiopathic convulsions of the face. Coming nearer to our own times, we find the distinction of which we have been

[1] HALL, *On the Disease and Derangement of the Nervous System*, London, 1841.

speaking again elaborated by Jaccoud,[1] in 1870, and accepted also by Rosenthal.

Doubtless physiologists and pathologists are not invariably at one as regards the proper characters of the two, and subdivisions into continuous tonic contractions as opposed to intermittent tonic contractions have been deemed necessary; but without burdening the subject with a plethora of detail, we think it simple, suggestive, and clinically satisfactory to uphold Willis's generalisations and to enlist their help in the exposition of the tics. Hence, unless under special circumstances, we consider recourse to the epithet "convulsive" superfluous, and we shall employ the word tic by itself, except when there may be occasion to indicate the form of muscular contraction. The gain in conciseness is not likely to be neutralised by any loss of precision.

From our rapid survey of the vicissitudes through which the tic has passed, we may profitably gather one or two lessons.

In so far as is compatible with its nature, the schematisation of tic is indispensable. The inevitable variability of the personal factor and the absence of a real breach of continuity between any two essentially differing morbid affections ought not to deter us from the attempt to project a line of demarcation between them. Natural science is pledged to the labour of differentiation. It is the glory of Charcot's alternately synthetic and analytic work to have demonstrated the value of this method in the sphere of neuropathology. At the same time, the wisdom of attaching only a provisional importance to any scheme and of welcoming possible modification is of course self-evident. Inexact and undiscriminating inference may be a stumbling-block in the path of progress and inimical to the

[1] JACCOUD, *Pathologie interne*, t. i. 1879, pp. 595-8.

cultivation of the faculty of observation. Further, inaccuracy of definition not only exaggerates the liability to misunderstanding, but has sometimes also the disadvantage of promoting an illusory belief in the possession of the truth.

## CHAPTER III

### THE PATHOGENY OF TIC

### TIC AND SPASM

OUR study of tic can be approached only after a preliminary understanding as to the meaning of two words too frequently confounded even in scientific literature—*tic* and *spasm*. Let us explain, then, once for all, exactly what we intend by the latter.

Etymologically (*σπασμός*, *σπάω*, I draw) the word signifies a twitch, but as it is unfortunately considered a synonym for convulsion, the two expressions are used indifferently in medical parlance, though the desirability of restricting the application of the former has more than once been indicated. Littré's definition —"an involuntary contraction of muscles, more particularly of those not under voluntary control"— may appear somewhat idle, as the contraction of muscles not under the influence of the will can scarcely be other than involuntary. His intention was, no doubt, to reserve spasm for convulsive phenomena in non-striped muscle fibres; but in this limited sense the term has not met with acceptance, and it remains equivalent to "involuntary muscular contraction," whatever that may mean. Thus interpreted, it is applicable to any and every involuntary muscular movement, physiological and pathological, to the incoordination of tabes, to chorea, athetosis, tremor, etc.

Rather than imagine a new substantive to cha-

racterise certain of these muscle contractions, we may retain the word in a somewhat wider though equally precise sense, and follow the distinction drawn by Brissaud[1] in 1893: "a spasm is the result of sudden transitory irritation of any point in a reflex arc; . . . it is a reflex act of purely spinal or bulbo-spinal origin."

By definition, then, *a spasm is the motor reaction consequent on stimulation of some point in a reflex spinal or bulbo-spinal arc.* To differentiate between the reflex, which is physiological, and the spasm, which is pathological, we may add as a corollary: *the irritation provocative of the spasm is itself of pathological origin, and no spasm can occur without it.* The anatomo-pathological substratum of a spasm is, then, some focus of irritation on a spinal or bulbo-spinal reflex arc, which may be situate in peripheral end organ, in centripetal path, in medullary centre, or in centrifugal fibre. Whatever be its localisation, it will determine a spasm in our sense of the word.

Cortical or subcortical excitation, however, as well as peripheral stimuli, may provoke these bulbar and spinal centres to activity. Irritation of a point on the rolandic cortex, or on the cortico-spinal centripetal paths, is followed by a motor reaction exactly as with afferent impulses; the sole change is in the route taken by the centripetal stimulus; the reflex centre remains bulbo-spinal, and the efferent limb of the arc is as before.

The application of the word spasm to these motor responses to cortical or subcortical stimulation is quite justifiable. Developmentally the grey matter of the cerebral convolutions is ectodermic, as is the skin, and capable of functioning as a sensory surface; it may be considered the end organ of an afferent path that

[1] BRISSAUD, *Leçons sur les maladies nerveuses*, 1st series, chap. xxiv. p. 506.

conducts to medullary reflex centres. According to our definition, then, provided the centre of the reflex arc be bulbo-spinal and the irritation pathological, the consequent motor phenomenon is a spasm.

A distinction must nevertheless be drawn between the two cases, inasmuch as in the one the afferent path is peripheral, in the other it is cortico-spinal, and there is a corresponding difference in the clinical picture. Jacksonian convulsions, consecutive to cortical stimulation, do not seem to bear much resemblance to spasmodic movements indicative of peripheral—*i.e.* sensory nerve—irritation. As a matter of fact, it is not always easy to differentiate the two, except by the aid of concomitant phenomena. The characteristic evolution of the Jacksonian convulsion is of course readily recognisable. We can similarly diagnose an irritative lesion of the internal capsule not so much from the objective features of the convulsive movements as from accompanying indications. In short, there need never be any occasion for confusion. Convulsive conditions attributable to irritation of cortico-spinal centripetal paths have long been described and analysed: they constitute well-recognised morbid entities, among which may be enumerated Jacksonian epilepsy, hemichorea, hemiathetosis, pre- and post-hemiplegic hemitremor, etc.

These clinical denominations for the affections under consideration it is at present desirable to retain. We shall not call them spasms; above all, we must not call them tics, else we shall end by confounding conditions absolutely distinct. The case recorded by Lewin,[1] under the title of "convulsive tic," of a three-year-old infant still unable to walk, who has daily attacks in which "all the muscles" twitch for about a minute at a time, is indeed a most singular tic. We were

[1] LEWIN, *Arch. d. phys. diat. Therapie*, 1900, p. 281.

under the impression that such an attack is usually known as an epileptiform convulsion. Is the term "convulsive tic" quite a happy synonym?

Again, in the recent thesis of Cruchet the attempt has been made to base the pathological physiology of tic on researches of von Monakow and Muratow apropos of the occurrence of choreic, epileptoid, or athetotic movements after certain lesions of the cerebro-spinal axis, and to find an analogy in the action of various convulsion-producing substances (Richet and Langlois). Cruchet's conclusion is that convulsive tic is as often cortical or subcortical as spinal in origin; that it is, in short, a mere symptom, common to many cerebro-spinal conditions.

The same regrettable confusion is discernible in various treatises on neuropathology the work of German and other foreign authors.

As far as we are concerned, the outcome of the whole matter is simply this: if tic is doomed to be used indifferently for convulsion, its retention in scientific terminology is unjustifiable. Rather, then, than widen its application, we prefer to restrict it; we shall employ the term convulsion in its most general sense of "any anomaly due to excess of muscular contraction," of whatever variety or origin; and we shall limit the use of the word spasm to phenomena the result of irritation at any point on afferent or efferent reflex paths, or in reflex bulbo-spinal centres.

In thus indicating our position, we find ourselves once more in accord with generally received opinion since the days of Charcot. These views have been excellently expressed by Guinon:

> Convulsive movements differ widely in kind. Some consist of localised spasms in the domain of a motor or mixed nerve, most frequently one of the cranial series—in especial the seventh—consecutive to some anatomical lesion, central or peripheral. The great majority of observers, French and

foreign alike, are in the habit of designating such movements "tics." . . . But they are only partial convulsions limited to the area of some one nerve, not true convulsive tics, differing alike in essential features and concomitant symptoms. From the anatomo-pathological standpoint, moreover, lesions are as constantly present in the one as absent in the other.

The opinion of Brissaud on the subject coincides with our own.

If we suppose now that the cortex ceases to act as a surface of peripheral excitation, and becomes itself a reflex centre, we note at once a complete change. The modification effected by the cortex on afferent impressions is obvious in altered motor reactions, which appear with the stamp of cortical intervention, herein differing from bulbo-spinal phenomena. To this category belong the tics; we shall soon see why and how.

Conformably, then, to convention sanctioned by usage, and especially by the teaching of Charcot and Brissaud, we have given a precise definition to the word spasm, and we can only solicit its general adoption.

To resume briefly the argument we have advanced in the foregoing paragraphs, we maintain:

If in a given motor phenomenon there is no evidence of actual or previous cortical intervention, it is not a tic.

If the motor reaction is consecutive to pathological irritation at any point on a bulbo-spinal reflex arc, it is a spasm.

If the cortex is or has been involved in its production, it is not a spasm.

Should it present, in addition to the fact of cortical participation, certain distinctive pathological features, it is a tic.

It is precisely these distinguishing characteristics that we shall now proceed to examine, preluding our study of them with one or two physiological considerations.

### TIC AND MOTOR REACTIONS; REFLEX, CO-ORDINATED, FUNCTIONAL, AUTOMATIC, AND VOLUNTARY ACTS

The instantaneous muscular contraction that follows the application of a drop of sulphuric acid to the limb of a decerebrate frog is an example of a pure spinal reflex. With the persistence of the irritation contraction of the other limb and of the whole body ensues; the simple spinal reflex has become generalised. Observe the frog a little longer. Soon the sound foot approaches the affected limb and attempts by rubbing to remove the point of irritation. A movement of attack has succeeded the simple movement of defence, and indicates a complete change in the nature of the motor reaction. In the first case the limb is withdrawn briskly from the painful stimulus; in the second the animal performs a series of co-ordinated purposive movements. The first reflex is automatic, and so no doubt is the second, since the frog is decerebrate. But a co-ordinated movement is not of necessity automatic from the outset; its automatism may be the sequel to voluntary education. Co-ordination is often a manifestation of cortical activity.

Take, next, the case of the infant. His earliest muscular movements are pure spinal reflexes. Pinch his leg, and he withdraws it; continue the stimulus, and he moves the other leg, his arms, his whole body; he starts to cry. The original reflex is becoming generalised, yet he makes no attempt to remove the source of irritation. Should a particle get into his eye, his lids will blink so long as the pain persists, but he never rubs them to expel the foreign body. In Virchow's phrase, the newborn infant is a spinal animal, endowed with spinal reflexes only; his responses to stimuli are beyond voluntary control.

More complex motor phenomena, however, equally independent of cortical influence, characterise the early

days of the infant's life. The contact of his lips with the breast at once elicits a reflex in the shape of sucking movements. These are obviously co-ordinated and adapted for a particular end; suction is a functional act. Yet the cortex plays no part therein; the act is automatic from the beginning. Peripheral excitation from tactile impression of nipple, teat, or finger is sufficient to provoke this reflex response.

Similarly with the functions of respiration and nictitation—their establishment follows the stimulation by air of the respiratory or conjunctival mucosa. The appropriate movements constitute the spontaneous reaction to afferent impulses; they are simple bulbar reflexes. Co-ordinated and purposive though they be, they do not come within the sphere of the will. The newborn child cannot voluntarily accelerate or retard his respiratory rhythm.

But a day comes when the formation of cortico-bulbar or cortico-spinal anastomoses renders possible the interaction of higher and lower centres; respiration may be made quicker or slower; the eyelid may be closed less rapidly, more often. In a word, cortical modification of function becomes a reality.

A further step in advance is soon taken.

Under the "law of least effort" the inhibitory power of the will reduces motor reaction for the attainment of a given object to a minimum. The infant begins to make more complicated movements, attempting the removal of a source of annoyance by direct attack, learning to scratch itself, to spit instead of swallow, etc.

The essential difference between these acts—a thousand other examples might be chosen—and the reflexes of the first group, is that the precise and regular execution of the former demands more or less prolonged education, repetition, and voluntary co-ordination.

It is true these co-ordinated acts are eventually performed with all the spontaneity of the simplest reflexes; voluntary co-operation is no longer indispensable; scratching, spitting, walking, can be effected without any actual intervention of the will. But we must not forget such muscular automatism entails a preliminary training in the shape of frequent repetition of purposive movements—a training which varies in duration with the individual and the nature of the particular movement. It is only after several years of volitional effort that such acts as locomotion or the expulsion from the throat of an irritant particle become really automatic.

The fact that the newly hatched chick is capable of walking has been advanced as an argument for the existence of congenital automatism. It is true that the chick's movements are very imperfect—it stumbles and falls, as does the infant, on the slightest provocation, and even without any apparent cause; but the rapidity with which certain animals acquire the faculty is so surprising that the latter almost appears to have been innate.

In all phenomena characterised as instinctive we cannot deny the existence of a certain congenital aptitude, the result possibly of ancestral education, owing to which some individuals learn infinitely more quickly than others, and in their case a period of preliminary education may seemingly be awanting. Probably the truth is, however, that this stage has been a very brief one. In man there is a gradual transformation of voluntary into automatic acts. Though no teacher be necessary, teaching is requisite. The infant learning to walk is really independent of his parents, and might, for that matter, be entirely self-taught; but the point remains, however automatic his walking subsequently become, that he begins by voluntarily

co-ordinating the movements of his lower limbs and trunk towards a definite end.

Another advance is still to be made.

With increasing cortical development the individual is able, on stimulation no longer peripheral but central in origin, spontaneously to execute movements which frequent repetition has endowed with all the features of functional acts. Of these ideomotor phenomena physical exercises, games, manual trades, readily furnish instances. Swimming, for an instance, requires the rhythmical co-ordination of arm and leg, to attain which perseverance, retentiveness, and above all repetition are essential. At length the time arrives when the swimmer is surprised at the absence of any necessity for voluntary co-ordinating effort on his part. In fact, to reintroduce volition into this acquired automatism would be to court disaster. "What I do naturally," said Montaigne, "I can no longer perform if I attempt it expressly."

From these physiological considerations we are led to make the following classification of motor reactions:

1. Simple spinal reflexes, innocent of co-ordination or functional systematisation, on whose production or inhibition the will has no influence. To this division belong the movements known as spasms.
2. Functional motor acts. Among these we may distinguish:
   - *a.* Essential movements, *e.g.* respiration, suction, etc., appearing at birth, and co-ordinated in view of some definite function.
   - *b.* Acts such as locomotion, mastication, etc., whose acquisition is subsequent to a more or less prolonged period of education.
   - *c.* Non-essential ideomotor acts, acquired later in life, which soon assume all the characters of functional acts.

The movements belonging to the first group in this latter category may manifest themselves without any exertion on the part of the will, but its activity is essential to the perfecting of the second, and the originating of the third.

In this last division are placed the motor phenomena known as tics.

### TIC AND CO-ORDINATION

We have thus come to see that a tic is a co-ordinated, systematised, purposive act. The majority of observers are satisfied on this point, although there exist various differences of opinion, more apparent than real, the inevitable result of disagreement as to the interpretation of certain expressions. It is imperative to obviate misunderstanding once and for all.

In his first contribution to the study of the disease which bears his name, Gilles de la Tourette gave the general description of *motor inco-ordination* to the convulsive movements of his patients. It has been argued by Guinon, on the contrary, that they are really systematised, and that they reproduce, in an involuntary manner, the co-ordinated movements of everyday life. That this is sometimes the case Tourette subsequently admitted, but he still professed their frequent actual inco-ordination.

This divergence of opinion is entirely attributable to difference of interpretation. Littré's definition of muscular inco-ordination is, "A condition occurring in various diseases of the nervous system, in which the patient cannot co-ordinate the necessary muscular movements for walking, grasping an object, etc." In this sense the term is applicable indiscriminately to the gesticulations of choreic, athetotic, or tic patients; to the ataxia of tabetics and others; to the tremor of

disseminated sclerosis or paralysis agitans, etc. An expression so general is not merely of no diagnostic value; it leads to positive confusion.

It is precisely in the type of inco-ordination that the difference lies. As rigorous a distinction must be drawn between the gestures of chorea and the gesticulations of the sufferer from tic as between the tremor of insular sclerosis and of Parkinson's disease.

In assigning an exact meaning to the term muscular inco-ordination, we cannot do better than quote the remarks of Guinon:

> The tabetic who throws his legs to right and left, who as he sits at table cannot carry his spoon to his mouth, furnishes an instance of true motor inco-ordination. On the other hand, the subject of tic performs his voluntary actions with perfect assurance; though his infirmity occasion all sorts of ridiculous involuntary arm movements, he never brings his fork against his ear or his cheek, nor does he spill a drop from his glass; his walk may be interrupted by a sudden halt to bend his knees and kneel, or to strike his foot violently on the ground, but he never trips one leg over the other and never falls.

In his article in the *Dictionnaire Jaccoud*, Letulle distinguishes two kinds of tics:

> The *convulsive tic* consists of a series of partial convulsions, while the *co-ordinated tic* is the expression of some complex act by a sequence of muscular contractions for that purpose. In the former case the resulting movement is irregular, abnormal, and useless; it is a muscular "shock" evolved without reason and continued without effect. . . . The normal individual usually possesses *in potentia* all the elements for the genesis of a co-ordinated tic. Some little trick or mannerism, arising perhaps from the necessity of gaining time for reflection, or from the desire of concealing some innate timidity, or of dissimulating some preoccupation, becomes sooner or later involuntary and automatic, and though maintaining its regularity and co-ordination, passes insensibly into the realm of pathology.

The distinction, however, is far from being absolute. Letulle himself admits it is a question of degree rather than of kind; the co-ordinated tic differs from the first variety only in its greater extent, complexity, and

duration. Now, the convulsive tic may be a local, partial, irregular, abnormal convulsion, yet these characteristics are not sufficient to differentiate it: biting the lips is classed by Letulle as a co-ordinated tic, but it is surely a local, partial, irregular, abnormal muscular act; and the explosive laryngeal "ahem!" he would similarly place, yet it cannot be said to be a phenomenon characterised by its extent, complexity, and duration.

According to Guinon, a further distinguishing feature of the convulsive tic is its frequent though inopportune reproduction of some reflex or automatic purposive movement of everyday life, whereas we have just seen that one of the elements in Letulle's co-ordinated tic is its purposiveness. In a word, these observers apply the same epithet to two varieties of tic which they are endeavouring to separate.

The explanation of the apparent contradiction is simple. A gesture which seems meaningless and useless to-day becomes intelligible and logical to-morrow, when we learn the reason for it. In the course of an attack of conjunctivitis a patient acquires the habit of winking his eye, and though the inflammation subsides, the habit persists. If we are ignorant of its cause, are we to call the tic convulsive since it appears to us needless? And if we do know its origin, can we say it is co-ordinated when one muscle only is involved in the contraction?

The distinction drawn by Letulle between the two groups may hold good in some cases, but certainly not in all, and in our opinion it is preferable to abstain entirely from the attempt to base a classification on variation in muscular contraction. Noir remarks very justly that intermediate forms occur which are difficult to place in one or other category. In face of the confusion to which an illogical division inevitably leads, we may safely leave this question

aside. In our view, the motor phenomena of the disease are always systematic, co-ordinated movements, directed for the attainment of some definite object. We exclude all simple bulbar or spinal reflexes, and all spasms, since the cardinal feature in these conditions is the absence of any functional systematisation.

### THE GENESIS OF TIC

We have seen how various purposive, co-ordinated movements may, by dint of education and voluntary repetition, become automatic and be automatically repeated should occasion arise. Imagine some such act recurring involuntarily without any apparent reason and for no apparent object; what does such an anomaly signify?

Take, for instance, the case of a young girl who inclines her head on her shoulder to relieve the pain of a dental abscess. The act is called forth by a real exciting cause; the muscular response is voluntary, deliberate, undeniably cortical in origin: the patient *wills* to appease the pain by pressing and warming her cheek. Should the abscess persist, the movement will be repeated less and less voluntarily, more and more automatically; but as the why and the wherefore still remain, there is nothing pathological about it.

With the healing of the abscess, however, and the consequent relief of the pain, the girl still inclines her head on her shoulder from time to time, albeit cause and purpose have ceased to operate. Her primarily volitional, co-ordinate, systematic, motor reaction is now automatic, inopportune, and meaningless: it is a tic.

Charcot[1] has given us an excellent description of the process:

> However complex and bizarre may appear the convulsive phenomena known as tics, they are not always as irregular, inco-ordinate, and con-

[1] CHARCOT, *Leçons du mardi*, 1889, p. 464.

tradictory as superficial examination might lead one to believe. On the contrary, they are, as a general rule, systematised ; in a given case they recur always in an identical manner, reproducing, and simultaneously exaggerating, complex, automatic, purposive movements which are essentially physiological ; they are in a sense the caricatures of ordinary acts and gestures. The tic is not in itself absurd ; it appears so only because it occurs inappositely, without obvious motive. Source of irritation is absent, yet the patient scratches himself ; he blinks, but no foreign body is to be detected in his eye.

Mere repetition does not, cannot, evolve a tic in every case. Not all who would may tic; psychical predisposition in the shape of volitional enfeeblement is a *sine qua non.*

Of the rôle played by mental insufficiency in the genesis of tic we shall have much to say later. The point we are desirous of emphasising now is that the first manifestations of tic have their origin in, and are dependent on, cortical activity, at least in a majority of cases.

Notwithstanding painstaking investigation, determination of the initial cause may no doubt be difficult in some instances, owing to the patient's ignorance or forgetfulness; for that matter, the observer may not know how to set about his task. Prolonged interrogation, however, and due consideration of the patient's environment, will generally enable him to reconstruct the pathogeny of the condition.

It has been our practice for some years now to examine with especial care into the mode of onset, and to scrutinise the reasons for the particular localisation, of any given tic; and we have been able, in practically every case, to rediscover the exciting cause, and consequently to explain the form taken by the tic in its earliest manifestations as a voluntary response to the stimulus. Time may have distorted the original movement, but a little patient analysis will facilitate its recognition even in the caricature made of it by the tic.

A few concrete instances will help us better to understand the nature of this psycho-physiological mechanism.

An individual is wearing a collar too small for him, and its frayed edge chafes his skin; the neck is at once abruptly inclined away from the irritating point—a simple spinal reflex movement of defence. Now that he is warned by the sensation of pain, he wishes to avoid it, which he does by bending his head to the opposite side. The act is similar to the preceding, but of a totally different nature; it is voluntary, not involuntary; cortical, not bulbo-spinal.

Next day the collar is replaced by another of ampler proportions. There is no further irritation of the skin, and accordingly no occasion for deviation of the head. Memory of the disagreeable sensation may perhaps incite him to verify the disappearance of the irritation by a few movements of the head, and in the normal individual the matter ends there. Even should the idea of repeating the gesture, now become meaningless, occur to him, he banishes it by an effort of the will.

With the candidate for tic things pass in quite a different fashion. Uncalled for though it be, he performs the brusque movement of yesterday perhaps with a view to satisfying himself that the pain is non-existent, but he is not thus satisfied. He does not limit his experiments to one or two attempts. He repeats it frequently and complacently. The original source of irritation is gone; the movement intended at first to relieve it persists. Soon the whole trouble is forgotten, but the reiterated gesture becomes habitual and automatic; it may have been rational yesterday, but to-day it is superfluous, if not actually prejudicial; it is a tic. In its evolution the cortex has had a part, and the very untimeliness of this cortical

intervention indicates a certain disorder of psychical function.

Or again: a speck gets under my eyelid, and I wink—a spasmodic act independent of the cortex. The speck is removed, but the conjunctiva remains a little tender, and I wink again—still only a spasm. All trace of irritation vanishes, yet the blinking persists: it is degenerating into a tic.

Wherein consists the rôle played by the cortex in the production of such phenomena? It intervenes to order the repetition of the gesture provoked involuntarily, in the first instance, by peripheral excitation; and though one may not always be able later to discover evidence of this, one must at the least recognise the fact that the mere inopportune persistence of the movement bears witness to psychical imperfection.

It has been remarked by Guinon that patients suffering from tics of blinking attribute them to the presence of foreign bodies; he declares, however, that "if they bear a superficial resemblance to simple tic, they differ widely in essential characters and from the point of view of prognosis. They are really involuntary movements of reflex origin, occasioned by abnormal sensations, usually of pain." He cites as a typical instance the "tic douloureux" of the face.

The description is strictly accurate provided the pain continue; such acts are not tics, they are spasms. On the other hand, the perpetuation of the movement in the absence of all exciting cause and pain constitutes it a tic. In this way a spasm may be the forerunner of a tic, and in many cases no doubt a purely spasmodic motor reaction may determine the form and localisation which the latter will adopt; but, as we have said, its first manifestation is usually a voluntary act of definite causation, and directed to the accomplishment of a definite object.

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The candidate for tic is mentally unstable. Indifferent perhaps to acute suffering, he may become entirely preoccupied by some trifling sensation of pain or by some source of petty annoyance, to rid himself of which he will resort to all sorts of tricks and assume all sorts of odd attitudes—tic germs quick to develop in suitable soil.

In many motor reactions of the class we are now considering the main object is the *avoidance of some abnormal sensation*, suppression of which, however, brings no relief to the patient's mind. He dreads its reappearance; he must assure himself of its absence. He taxes his ingenuity in the attempt to rediscover the sensation, and multiplies his gestures and attitudes until once again he experiences it. The satisfaction he felt originally in shunning the pain or the discomfort is paralleled by the satisfaction he now knows in its rediscovery. In each instance the motor phenomena are voluntary and co-ordinated, but their excessive repetition betrays unstable mental equilibrium.

Instructive examples of this pathogenic process are furnished by the history of O., and by the case of a young patient J., from which we extract the following:

In 1896, during the holidays, a tic, secondary to some slight nasal ulceration, made its appearance. The child learned the trick of wrinkling its nose and of puckering its upper lip, sometimes attempting by various facial grimaces to lessen the irritation due to the little nasal sore, sometimes, on the contrary, finding delight in deliberately seeking the unusual sensation. The sniffing soon became involuntary, and for the next two months, long after the ulceration was healed, this nasal tic continued.

Then another cause came into operation, occasioning a new gesture and entailing a new tic. Cracking of the labial mucous membrane during winter led to incessant licking and nibbling at the roughened surface. With the first excoriation the patient proceeded to moisten his lips with his tongue, whence fresh cracks, followed by the renewal of nibbling and licking movements.

In March, 1899, after a severe attack of influenza accompanied by fever and pains in the joints, he began to complain of stiffness and a sort of cracking in the neck, disagreeable rather than painful. To avoid this, or to reproduce it—as one sometimes amuses oneself by "cracking one's joints"—he quickly learned to make all sorts of bizarre head movements, and so a tic of the neck started which lasted several months.

Noir has directed attention to a tic of frequent occurrence among amaurotic idiots, consisting in rapid to-and-fro movements of the finger before the eyes. The explanation seems to be that their blindness is not absolute enough to prevent some faint appreciation of light by retinal stimulation, and the effect of the luminous impression is enhanced by the alternation of light and shade sensations produced by the waving of the fingers in front of the eyes. The tic is neither more nor less than a search after this effect.

Another case in point is reported by Dubois [1]:

The patient is a young woman twenty years old who has acquired the habit of beating her right elbow against her chest fifteen or twenty times a minute, until it happens to impinge with rather greater violence on a whalebone in her corset; this is accompanied by a slight guttural cry. It would appear the sole satisfaction in her tic is in the attainment of this object, since it is succeeded by temporary cessation of the movements. Their constant repetition has caused an insignificant erosion of the skin over a limited area on the elbow, and it is only when this particular spot is touched that the ejaculation is uttered and the tic arrested. If the elbow be at rest, the head is inclined from left to right several times a minute.

Evidently, then, in the subjects of tic the *impulse to seek a sensation* is of very common occurrence, as is also the *impulse to repeat to excess a functional act.* It is precisely this exaggerated and inopportune multiplication of movement that is pathological.

The mother of one of Noir's patients was always tempted to repeat any simple purposive movement

[1] DUBOIS, "Traitement des tics convulsifs par la rééducation des centres moteurs," *Bulletin général de thérapie*, April 30, 1901

that she had made a moment before, even though the reason for the act no longer existed.

The imperiousness of these impulses, and the peculiar relief attendant on submission to them, accentuate the closeness of the resemblance between tic and obsession, to which reference will be made later; but it is necessary at this early stage to indicate the bearing of these psychical phenomena on the pathogeny and diagnosis of tic.

Many of the conditions with which we are dealing are characterised in addition by an emotional element. Dupré[1] believes an emotional shock is the exciting cause of tic, as it sometimes is of obsessions.

Apropos of this view, we may quote again from the history of the young patient J.:

> During his holidays he improved sufficiently to enable him to resume his classes, but another attack of influenza in the beginning of 1900 was the occasion of a relapse. He began to complain of overpowering fatigue; became depressed and morbidly anxious about his future; had attacks of hysterical sobbing; suffered great mental anguish, accompanied by flushing and profuse perspiration; in short, he fell into a veritable state of *mal obsédant.*
>
> At the same time, the slightest pain or annoyance was a pretext for his tics to exhibit themselves with redoubled vigour. Even the mere idea of his tics, the fear of them, incited him further in the same direction. He seems then to have set himself to invent new movements, and forgetting forthwith that he himself was their creator, became alarmed at them as sure signs of the aggravation of his disease.

Analogous details will be found in all cases which have been studied as well from the mental as from the physical side. For our part, we consider a tic cannot be a tic unless it be associated with a certain degree of mental instability and imperfection, indubitable evidence of which is furnished by a psychical abnormality of constant occurrence in this malady—viz. anomalies of volition.

[1] DUPRÉ, *Soc. de neur. de Paris*, April 18, 1901.

### TIC AND WILL

It might be imagined that a tic would cease to exist as such were a voluntary element to enter into its constitution. The fact, however, that tic is the sequel to frequent repetition of a primarily voluntary act, and that it may be arrested, transformed, or aborted, is proof to the contrary of which there is no gainsaying.

The truth is, once a tic is established, it has all the appearance of an involuntary movement, but that nevertheless its manifestations may be either modified or inhibited by an effort of the will is patent from clinical observation. This is a fact of great importance.

> Spasm knows no control (says Brissaud). Nothing will arrest the bolus of food as it passes into the pharynx, unless by the inversion of the whole function of deglutition. . . . As regards tic, however, inhibition is possible because the phenomenon is cortical. In almost every case, reinforcement of the will can momentarily at least check it.

Consensus of opinion admits diminution of will power to be the cardinal mental symptom of the tic patient. Inhibitory insufficiency, as Blocq and Onanoff say, allows the persistence of fixed ideas of movement which reveal themselves by involuntary acts. Noir has admirably supplemented the researches of Ribot in this direction:

> The infant's activity is purely reflex, and manifested by a profusion of movements, to suppress or restrain the majority of which is the task of education. It is highly probable that any co-ordinated tic whose evolution can be traced at all has its origin in the infant's spontaneous muscular play. From this point of view the frequency of these movements in idiots is readily explicable, since their intellectual development never gets beyond the stage of childhood. The more confirmed the idiocy and the more rudimentary their mind, the more prone are their tics to be complex and inveterate.

These remarks are pertinent to the case not only

of idiots, imbeciles, or backward children, but of all the subjects of tic. In them some degree of mental infantilism is of invariable occurrence. The tic patient has the weak and capricious will of the child; young or old, he does not know how to *will*; if his willing be sometimes excessive, it is never resolute. Were it otherwise, he might control his meaningless gestures, but his efforts are both feeble and ephemeral.

### TIC AND HABIT

The view which regards tic as a "pathological muscular habit" provides emphatic illustration of the sinister influence of volitional infirmity.

This aspect of the question is of deep significance. If we define a habit, in the words of Littré, as a "disposition acquired by the repetition of the same acts," we can easily conceive how intimate is the relation between habit and automatism, and how constant rehearsal of the same movement in the same manner will create a mode of motor reaction independent of the function of the will. It has been made clear already that the phenomena of tic, regarded from the motor standpoint, reveal an identical process at work; but the fundamental difference between the habits of normal individuals and those of tic subjects is that the former can be checked or modified by voluntary effort, whereas the latter gradually acquire the pathological features of tenacity and irresistibility.

In a typical case of tic (says Dupré)[1] the establishment of a reflex sensorimotor diastaltic arc, viâ the cortex, between peripheral stimuli of whatever nature and corresponding muscular reaction, is a sign that predisposition has changed the physiological to the pathological, and transformed a habit into a tic.

Guinon argues, however, that tic ought not to be

[1] DUPRÉ, *loc. cit.*

cited in the catalogue of diseases, since it is ultimately a deep-rooted "bad habit" only, not a pathological fact.

We are not prepared to maintain, of course, that all motor "bad habits" are tics, for a whole host of familiar gestures, tricks, and mannerisms do not merit the name, superfluous and even detestable though they may be. It is true they are the product of education, and become, since the will has less and less to do with their appearing, at the last purely automatic; they may thus developmentally bear a close resemblance to tics. As Letulle says:

> The infant who is constantly sucking its thumb, the individual who never ceases picking his teeth, or rubbing his eyes, or lips, or chin, or ear, who is for ever scratching his head or his beard—all have no doubt, originally, been driven to the repetition of the trick by some real necessity in the shape of dental caries, or ciliary blepharitis, or pityriasis capitis; but removal of the cause is not followed by cessation of the gesture. A man will learn the habit of perpetually smoothing his hair, and will not desist from his favourite trick though he become absolutely bald.

But such automatic habits and mannerisms are not genuine tics so long as the movement executed conserves in form the characters of a normal gesture. Be it never so inopportune or absurd, it is not a tic. It comes rather under the heading of *stereotyped acts*, whose kinship with, and difference from, the tics, have been well demonstrated by Séglas.

While the stereotyped act has all the appearance of a normal movement, the tic, on the contrary, is a "corrupt" muscular contraction; its subject is irresistibly impelled to its performance, and any attempt at repression is painful, sometimes even agonising. Victory is perhaps not entirely impossible, but any arrest is, as a rule, only temporary, and entails suffering which well deserves to be considered pathological.

On the other hand, the thousand illogical and absurd mannerisms of which we have been speaking betray no irresistible imperiousness in their execution, and require no agonising struggle for their repression. They are not tics. The crucial point in the differential diagnosis is the presence or absence of mental suffering.

The distinction may be further elaborated. Concentration of the attention may diminish the intensity or even inhibit the occurrence of a tic; inversely, a simple bad habit is manifested preferably during this very concentration. In the heat of physical or intellectual labour, we have all our favourite and characteristic tricks: we curl our moustache, we twist our beard, we scratch our forehead, we rub our chin, we nod our head, we fidget with our fingers in reading, speaking, reciting—in any mental or physical exercise requiring our attention we reveal innumerable little oddities of movement; but let our thoughts be directed for an instant to these gestures of distraction, and they disappear forthwith, to reappear afresh when we are absorbed in our work again. Charcot used to twist his hair round his index finger so intricately that to disentangle the finger one day a lock of hair had actually to be cut off. It was a trick of his, not a tic.

In the case of the latter, leisure of mind and body is the signal for the apparition of the inopportune movements. Any form of effort demanding the attention will, as a general rule, lessen their frequency or abolish them altogether.

Trousseau quotes the case of a young girl afflicted with severe tic who could play through any piece on the piano without the slightest interruption. Guinon similarly has known cases, one of whom could juggle accurately with knives, and another whose infirmity did not prevent her from taking a successful part in operatic ballet. Young L. is passionately fond of dancing,

but he never tics in the ballroom. O. is an excellent amateur billiard player and never handicapped by his tic when playing, or, for that matter, when fishing or fencing; but if his attention be not thus absorbed, it is only with the utmost difficulty that he can master his tic.

We all have met the young man who cannot strike a ball at tennis without protuding his tongue at the same moment; his partner bites his lips at any difficult stroke. At other times neither betrays the slightest grimace; neither is conscious of any effort in maintaining repose. The occurrence of these movements during active concentration of the attention, and the absence of either difficulty or distress in checking them, justify their classification as stereotyped acts, in subjects psychically normal.

Tic is a pathological habit, to use Brissaud's phrase, and its description as a habit disease is in harmony with the facts. We must expect, of course, to meet every intermediate variety between the bad habit and the true tic, but this need not deter us from drawing the above-noted distinction, the application of which will be found not without value in the great majority of instances.

### TIC AND IDEA

As we have already seen, a peripheral stimulus may originate a cortical reflex whose expression is a motor reaction, or the reaction may take place where the stimulus is entirely cortical; in other words, an idea may be the starting-point of a movement which may in its turn degenerate into a tic. All that has been already said of these phenomena is applicable to this movement of ideational origin. It too will be transformed into a tic when it is repeated without exciting

cause and for no definite end, when its reiteration becomes imperious and irresistible, its suppression accompanied with malaise and its execution with relief.

Tics of this sort are numerous enough. "To think an act," as Charcot used to say, following Herbert Spencer and Bain, "is already to accomplish it. When we think of the movement, say of extension of the hand, we have already sketched it in our minds; and, should the idea be too strong, we execute it."

In this connection Grasset most appropriately cites the fact that the peoples of mid-France evince a peculiar aptitude for mimicking by suitable gesture the various ideas which occur in the course of conversation. "You will always succeed," he says, "with the following little experiment. In a drawing-room ask ten individuals consecutively to tell you what a rattle (*crécelle*) is. The answer will in every case be accompanied by a gesture expressive of an object that turns. To think an act is already to perform it; the thought and the gesture are wellnigh inseparable."

The truth of this observation is not a question of geography. Examples are met with on every hand. It is a law, abundant evidence for which is furnished by all who tic. But however exuberant be accompanying movements of explanation, they must present the additional features of inappositeness and irresistibility to be denominated tics.

A case that has come under our own notice is worth mentioning because of its peculiarity and instructiveness. The patient was an artistic, well-educated, and well-travelled man, gifted to a remarkable degree with the faculty of assimilation. Apart from genuine tics in the shape of sudden jerks of face, arm, or leg, he had acquired the trick of accompanying his conversation with a peculiar mimicry of its content. Not satisfied with providing a gesture for nearly every word, he

divided the words themselves into syllables for each of which he had an appropriate action, whence arose a series of mimicry puns of most unexpected effect.

For instance, during the enunciation of the following sentence, "We were on a paddle steamer, with captain, commissaire, and doctor," he first of all imitated the movement of paddles; he then put his hand, with three fingers apart, to his forehead (the captain's cap has three lace bands); to mimic the word commissaire he shook hands with himself (*commissaire—comme il serre*); to express the word doctor he pretended to touch imaginary breasts on his body (*médecin—mes deux seins*); and so on throughout all his conversation.

Voluntary execution of these puns had been succeeded by complete automatism, yet they were not tics, because, however singular the mimicry, it was appropriate; whereas his facial grimaces, the shrugging of his shoulders, the tapping of his heels, repeated every minute for no reason or purpose, were real tics.

If, when asked what a rattle is, we make a turning movement with our hand, or if when asked to explain the word *brandebourg* we indicate an imaginary arrangement of braid on our coat—these two experiments always succeed—we are attempting to express an idea by mimicry at the actual moment of its arising in the mind; but the subject of a tic—which may primarily have been the representation by mimicry of an idea —continues the gesture long after the idea which provoked it has vanished.

A woman speaking with animation at a telephone will make with face or hand a thousand useless gestures, useless since her friend cannot see them, but they are not tics, even though they may be justly described as functional, automatic, superfluous, and inopportune. If we are normally constituted, we betray a pleasant idea by a smile, we express our conviction

by an appropriate gesture of affirmation; if we smile or gesticulate with no motive for doing either, we have begun to tic. It is not sufficient that the act be untimely at the moment of execution; we must be persuaded that it no longer stands in any relation to the idea which called it forth at the first, and that its repetition is excessive, its inappositeness constant, its performance urgent, and its inhibition transient, before we can say it is a tic.

Should the cortex be functioning harmoniously, afferent impulse and efferent reaction stand in due proportion one to the other; but any disturbance of psychical equilibrium—*e.g.* the fixity of some idea combined with inhibitory weakness—will effect a corresponding disturbance on the motor side. Charcot used to speak of tics of the mind revealing themselves by tics of the body. Fear may elicit a movement of defence, to persist as a tic after the exciting cause has vanished.

It is of course quite incorrect to say that each and every motor reaction to a pathological idea is a tic. The psychasthenic who in his fear of draughts shakes the door-knob a hundred times a day to make sure the door is shut, is not a martyr to tic; in spite of the absurdity of his action, it is logically connected with the idea that originated it, and it is the idea which is absurd. To make an involuntary movement of defence against some purely imaginary ill, on the other hand, and to continue when all fear is past, is to tic.

In practice it may not always be a simple matter to uphold the distinction, but some such demarcation of the tic's limits is called for if we are to avoid its being applied to any act performed under the compulsion of a pathological mental state.

In its mildest form the mental trouble may consist of an ordinary psychomotor hallucination, but if it be not

projected as an objective phenomenon it does not deserve to be called a tic. One of Séglas's patients met a choreic woman undergoing electrical treatment in the same room as herself; on leaving she felt as though her own right arm were the seat of spasmodic movements similar to those of the choreic patient, but as they did not betray themselves by any external sign they cannot be considered tics.

The exteriorisation of the hallucinatory phenomenon suffices at once to bring it within the scope of our definition. Innumerable tics arise in this way, provoked, mayhap, by some or other insignificant psychomotor hallucination. The attitude adopted by certain patients, as remarked by Séglas, is an index to the nature and seat of their hallucinations. Some keep their tongue firmly bitten between the teeth; others cram their mouth with pebbles, or compress their epigastrium tightly, under the impression that it is the source of their voice. Should such gestures persist while the hallucination does not, they may give rise to what we are in the habit of calling "tonic tics," or "tics of attitude," but we must repeat that the presence of a convulsive element is essential; however out of place or absurd the contractions are, if otherwise they are normal we are dealing with what Séglas designates stereotyped acts. To this question we shall return later.

### TIC AND CONSCIOUSNESS

According to Guinon, proof that "convulsive" tic is conscious is furnished by the accurate description and rational explanation patients supply of their affliction. Similarly Letulle's "co-ordinated" tic is a conscious act, at least in its commencement; it is a "bad habit" which finally passes beyond the limit of consciousness.

Now, while no doubt most subjects show a keen

appreciation of their tic when their attention is directed to it, they are none the less unconscious of it at the moment of its manifestation. This is the ground on which Letulle bases his statement that all tics, of whatsoever variety, are habitually outside the domain of consciousness. To this fact so much importance has been attached that the attempt has been made, more especially by Blocq and Onanoff,[1] to differentiate the conscious from the unconscious tic.

In our opinion, the distinction is ambiguous and tends needlessly to complicate our ideas on the subject. The patient with "convulsive" tic is conscious of it in the sense that he is well aware of its existence, yet how can the gesture be a conscious one if it is synchronous with mental preoccupation? On the other hand, the patient with "co-ordinated" tic may bite his lips unconsciously, but he is by no means ignorant of his little failing.

This divergence of opinion depends entirely on the possibility of regarding the phenomena at different moments during their production. The subject is in a position to appreciate his state both before and after the tic, not during it. In a sense it may be said that tic is alternately conscious and unconscious, in which respect it is comparable to the obsession; the close analogy between the two conditions we shall indicate more fully later. As a matter of fact, the same holds true for every variety of spasm.

We are not disposed to introduce here a term sacred to the psychologist and to speak of the tic as subconscious. Pierre Janet does not admit the absolute unconsciousness of habit; even when the latter has degenerated into a tic, it is not outwith the realm of consciousness. We prefer not to venture, however, into the perilous region of the subconscious, in spite of our

[1] BLOCQ and ONANOFF, *Maladies nerveuses*, 1892.

appreciation of the happy results attributable to its careful and discerning exploration by observers such as Janet himself.

According to Cruchet, certain so-called psychical tics are always subliminal—for instance, the imitation tics common in children and in idiots.

But if the consciousness of the normal adult be, as it admittedly is, a most elusive conception to define, how infinitely more precarious is the task in the case of idiots or infants! Cruchet says it is impossible to be sure whether at any given moment a tic has been above the threshold of consciousness or not; and we do not think the question will be elucidated by the introduction of data so difficult to comprehend as the consciousness, unconsciousness, or subconsciousness of the tic patient. In any case, these conceptions are quite inadequate for the establishment of useful distinctions. All that we can say is that the participation of consciousness in the phenomena of tic varies in time and degree. To hazard farther would be to invite disaster.

### TIC AND POLYGON

The proposal has been made by Grasset to apply his attractive hypothesis of the cortical polygon to the interpretation of the pathogenesis of tic. It is desirable, first of all, to recall briefly the significance of the word polygon in the sense adopted by that neurologist.[1]

At the central end of the physiological ladder is the superior or cortical system of perception neurons whose cells form the grey matter of the convolutions. Physiological and clinical research necessitates the subdivision of this system into two groups—the neurons of psychical automatism, and the neurons of superior (*i.e.* voluntary or free) cerebration. The former function is not of the same level as the ordinary reflex

[1] GRASSET, *Anatomie clinique des centres nerveux*, Paris, 1900, p. 5.

arc, since it is in relation to co-ordinated, intelligent, and in a sense conscious acts; at the same time it is to be distinguished assiduously from the latter, in which we include our personality, moral consciousness, free will, and responsibility.

Activity on the part of the inferior psychical neurons is seen:

1. In normal individuals—during sleep, dreams, and acts of distraction.

2. In the nervous—in nightmares, oniric states, table turning, thought reading, the use of the divining rod, automatic writing, cumberlandism, spiritualism.

3. In the diseased—in somnambulism, catalepsy, hysteria, certain phenomena of epilepsy, hypnotism, double personality; also in some cases of aphasia, and in such conditions as astasia-abasia. Every manifestation of this inferior psychism is characterised by spontaneity, herein differing from mere reflex acts, but not by freedom, which is the *propre* of superior psychism.

The various neurons subserving the former or inferior function are cortical, and form the cortical polygon. Situated at a higher physiological level are those for the latter function, united in what I designate the centre O.

Grasset's general conception of tic is accordingly as follows:

In contradistinction to a pure reflex, a tic is a complex or associated act. There is, however, more than one centre for the elaboration of these complex or associated acts, notably the bulbo-medullary axis, and the cerebral polygon, as we call it. The former serves as centre not merely for simple reflexes, but for true associated acts also, such as conjugate deviation of the head and eyes, walking movements in the decerebrate animal, etc.

We can conceive, then, a first group of non-mental tics corresponding to and reproducing these movements of bulbo-medullary origin.[1]

Let us turn now to our polygon formed by the various centres of psychic automatism. Polygonal reactions, such as writing or speaking, exceed both simple reflexes and bulbo-medullary associated acts in complexity; they are to all appearance spontaneous and in a certain measure intellectual, but they are neither free nor conscious—attributes that distinguish the functions of the centre O, the seat of the personal, conscious, voluntary, responsible ego. The polygon consists of receptive sensory centres for hearing, vision, and general sensibility, and of transmitting motor centres for speaking, writing, and various body movements. They all communicate with each other, with O,

[1] GRASSET, *Leçons de clinique médicale*, 3rd series, fasc. i. 1896, pp. 5, 38.

and with the periphery, so rendering possible voluntary modification of automatic action. In some cases, on the contrary, there may be a sort of dissociation between O and the polygon, when the activity of the latter becomes supreme, as during sleep—we dream with our polygon—or in distraction.

In states intermediate between the physiological and the pathological, pure independent polygonal action may reveal itself in the remarkable phenomena of nightmare, the divining rod, table turning, automatic writing, etc., while certain aphasias and agraphias, somnambulism, catalepsy, and various hysterical conditions constitute the pathology of the polygon.

The fact that all mental attributes and functions are situate in O definitely negatives, in my opinion, any classification in the category of mental diseases of such conditions as hysteria, so many of whose manifestations are polygonal alone.

Our second group of tics—polygonal tics, we may style them—are correspondingly associated, co-ordinated, and psychical, but not mental; they have nought to do with the superior psychism of O.

Finally, in direct and strict dependence on an actual idea is a third group of tics, the psychical tics properly so called.

We have reproduced Grasset's theory in some detail since it is one of the two most recent contributions to the study of the tic's pathogenesis. The other is that of Brissaud.

An apparent lack of harmony between the rival hypotheses is, we shall see, due rather to a difference in the interpretation of certain terms than to a real opposition of ideas.

Brissaud's view that the tic is a co-ordinated automatic act and consequently cortical is objected to by Grasset. Every automatic co-ordinated act is not of necessity cortical. Conjugate deviation of the head and eyes may be of bulbar origin; certain spinal movements even may be no less co-ordinated and automatic. The decerebrate animal's walk may be perfect in its co-ordination.

Careful analysis shows the divergence of opinion to arise merely from a differing significance attached to the word origin. Brissaud is considering the origin of the tic in time, at the moment of its appearance;

Grasset its origin in space, at the seat of its production. Once the tic is constituted, its repetition each moment is a manifestation of polygonal activity, but it is none the less true that the movement which has degenerated into a tic had its source in cortical, *i.e.* psychical, activity.

Any one who appreciates the import of Grasset's ideas will readily understand his terminology; it is at the same time expedient that the possibility of ambiguity in the use of words etymologically synonymous should be avoided. Now, however judicious be the distinction he draws between psychical and mental, it is to be feared it is not always adequately grasped: we do not intend, therefore, to employ either mental or psychical tic in our vocabulary, still less "psycho-mental" tic (Cruchet). As for bulbo-medullary tic, it appears to us to be identical with spasm as we have defined it, unless indeed it is to be taken as signifying a tic begotten of a spasm, in which interpretation Grasset and Brissaud both acquiesce.

## TIC AND FUNCTION

We must now pass on to elaborate our conception of tic as a disordered functional act.

The term function is employed to denote various biological phenomena differing widely in manifestation and design. Vegetative functions such as digestion, circulation, urination, etc., are regulated by a special unstriped muscle system, the mechanism of which cannot be suspended by cortical interposition; hence under no circumstances can its derangement bring a tic into being.

Other functions, subserved by striped muscles, come within the range of voluntary activity. Some—*e.g.* respiration—are essential to the maintenance of life, and scarcely to be differentiated from those we have

called vegetative. Others, such as nictitation, mastication, locomotion, are no whit less important, since their cessation, in the absence of extraneous aid, would speedily have a detrimental effect on the organism. They too are in a sense vital.

Others, again, such as expectoration, are useful, though not indispensable. Some people labour under the disadvantage of being unable to expectorate, but it is not a fatal defect. The function is not universal.

Finally, let us take once more the case of the child.

As he grows up he passes by easy transitions from the voluntary to the automatic stage. He is taught to swim, and swimming soon rivals walking in the unconcern with which the movements are executed; he learns to write, and no less rapidly does the act become one of unconscious familiarity; his games, his exercises, the labour of his hands—be it digging or typewriting—all reach the level of regular automatism; in short, they are functional acts as truly as locomotion or even respiration, with the qualification of being neither essential nor general.

Such examples serve to illustrate the comprehensiveness of the term functional, and embody all the intermediate forms between what is inherently vital and what is purely acquired. When we have to deal in practice with a case of functional disease, discrimination is obligatory from the standpoint of prognosis. We are alarmed at our patient's respiratory embarrassment, not at his impaired caligraphy.

A distinction has also been drawn between *functional* and *professional* affections, profession being conceived as a function of the individual in relation to society. But the latter term has the drawback of being too exclusive. As a matter of fact, scriveners' palsy is met with in people who, so far from being professional writers, do not use the pen much at all. Nor

is it necessary to be a professional pianist to develop pianists' cramp. It would be more accurate to speak of disturbances in "occupation acts," it being understood that these have by dint of repetition acquired the automatic characters of true functional acts.

Let us consider for a moment the salient features and component elements in our conception of function.

First and foremost is repetition. It is an absolute law, this of the periodicity of function, and strikingly exemplified in the case of the circulation, digestion, urination, etc. Regularity of rhythm is no less obvious in the muscular activity of mastication, locomotion, and respiration, and its degree seems to be in direct proportion to the duration and vital importance of the particular function.

The characters of this rhythm may be influenced by various extraneous causes. A painful stimulus makes us blink or quickens our respiration. The will may intervene, to accelerate or retard. The personal factor accounts for individual differences, but for each individual a certain rhythm and amplitude of movement, suited exactly to the end in view and conforming to the natural law of least effort, may be regarded as normal. It is only in pathological cases that this law admits of exceptions, and these we shall now proceed to investigate.

Disobedience to the law in the shape of exaggeration or redundance of purposive movement indicates functional excess. For instance, the object of the function of nictitation is to moisten the conjunctiva. In its evolution the child's unmethodical reaction gives place to the rhythmical automatism of the adult. Perfection is the fruit of education.

But the person whose impetuous and uninterrupted blinking far exceeds the demand of the eye for lubrication

is plainly troubled with excess, with "hypertrophy" of function. Herein may consist a tic, and, in fact, a large number of tics are nothing more than functional derangements of this kind.

The execution of a functional act at an inopportune moment constitutes another variety of functional disorder. A smile with no pleasant thought to correspond; a cry, a word, that betoken no precise idea; a gesture to relieve an irritation that does not exist; a chewing movement when the mouth is empty—all are examples of untimely, inappropriate functional acts, which merit the name of tics if in addition they are anomalous as regards rhythm, amplitude, and intensity.

Again, the performance of function is accompanied by antecedent desire and subsequent satisfaction. Authoritative proof of this law is furnished by the case of micturition and of defæcation, although momentary suspension of the function of nictitation or of respiration is also a sufficiently convincing mode of demonstrating its truth. In the case of locomotion and other motor functions a preliminary feeling of need may not be so imperative, but it is none the less constant.

Now, it has been observed already that these are equally conspicuous features in our conception of tic. In so far, then, as the latter is preceded by irresistible impulsion and followed by inordinate content, it may be considered a functional affection.

We cannot, however, dispose of each and every tic as an anomaly of some normal universal function. We have already had occasion to notice a large number of functional acts that are not of general distribution, so-called professional movements, which of course are liable to derangement. Such functional disturbances may be styled professional cramps, spasms, or neuroses; but are they identical with tics?

To attach the majority of them to the tics is, in

our opinion, justifiable. They are the clinical expression of abnormalities supervening in a function that has by repetition acquired the automatism of genuine functional acts: they are germane to the tics. In certain points, however, the analogy is not absolute.

Professional cramps are motor phenomena distinguished by arrest of intended movement. Spasm signifies excess of motor reaction, cramp denotes its inhibition. It cannot, then, be said that they present the characteristic features of spasm as we have defined it: they are akin rather to a form of tonic tic of which we shall give instances later.

With this premise, we can identify the professional cramp as a functional anomaly recognisable by defective amplitude and force on the part of the motor reaction. Its most special character is its appearance exclusively during the exercise of the function of which it forms the anomaly. Writers' cramp manifests itself in the act of writing, dancers' cramp during dancing, and so on. We are ready to admit the close affinity of professional cramp to tic, with which it has an additional element in common in its occurrence among the psychically unstable. But, regarded as a tic, it is unique in its dependence on the casual exhibition of the professional act; as long as the telegraphist has no occasion to transmit messages, his occupation cramp will not incommode him in the least.

The great majority of genuine tics, on the other hand, are roused into activity by anything or nothing, and this distinction is fundamental.

With all due recognition, therefore, of the marked resemblances between the two, we shall be well advised in not confounding them under one designation. For want of a better word, we shall use the phrase professional cramp to specify functional disturbances taking place solely during the discharge of professional acts.

One other class remains to be dealt with, consisting of functional acts not merely superfluous but actually prejudicial to him who is at once their creator and their slave. The idea that induced them and the object they have in view are alike irrational.

An individual as he moves his arm one day becomes aware of a cracking feeling in his shoulder-joint, and from the unwonted nature of the sensation emanates the notion that he must have some form of arthritic lesion. Renewal of the gesture is attended with reproduction of the sound. The thought of a possible injury develops and extends until it is an object of constant preoccupation and becomes a fixed idea. Under its malign influence the movement is repeated a hundredfold and with growing violence until it passes into the field of automatic action. It is typically functional in its repetition, in the association of desire and satisfaction; but it originates in an absurd idea, and is actuated by a meaningless motive: its range is exaggerated, its performance irresistible, and its reiteration pernicious. In fact, it is a tic.

We may thus regard tic as an obsolete, anomalous function—a *parasite function*—engendered by some abnormal mental phenomenon, but obeying the immutable law of action and reaction between organ and function, and therefore just as prone to establish itself as any motor act of the physiological order.

## CHAPTER IV

### THE MENTAL CONDITION OF TIC SUBJECTS

THE existence of psychical abnormalities in the subjects of tics is no new observation. Charcot[1] used to say that tic was a psychical disease in a physical guise, the direct offspring of mental imperfection—an aspect of the question which has been emphasised by Brissaud and by ourselves on more than one occasion.[2]

How is the involuntary and irrational repetition of a voluntary and rational act to be explained? Why is inhibition of a confirmed tic so laborious? It is precisely because its victim cannot obviate the results of his own mental insufficiency. Exercise of the will can check the convulsive movement, but it is unfortunately in will power that the patient is lacking. He shows a peculiar turn of mind and a certain eccentricity of behaviour, indicative of a greater or less degree of instability (Brissaud). Noir writes in much the same strain, that careful examination will readily demonstrate the secondary nature of the motor trouble; behind it a mental defect lurks, which may pass for singularity of character merely, or childish caprice, but which none the less may be the earliest manifestation of fixed ideas and of mania.

It is a matter of some difficulty to describe adequately the features of this mental condition; their extreme

[1] CHARCOT, *Leçons du mardi*, 1887-8, p. 124.

[2] *Communication faite au Congrès de Limoges*, August, 1901; *Soc. de neur. de Paris*, April 18, 1901; *Gazette des hôpitaux*, June 20, 1901, p. 673; *Progrès médical*, Sept. 7, 1901, p. 146.

variability has its counterpart in the diversity of the motor phenomena. In this polymorphism of psychical defect is justification for the numbering of the tic patient with the vast crowd of degenerates, and indeed Magnan[1] is content to consider tic one of the multitudinous signs of mental degeneration. As a matter of fact, one does find numerous physical and mental stigmata in those who tic, just as one finds them in those who do not.

It therefore becomes desirable to specify in greater detail the mental peculiarities of patients who, by reason of their motor anomalies, form a distinct clinical group both from the neuropathological and from the psychiatrical point of view. The pathogeny of these motor troubles will thus be elucidated and valuable indications for treatment obtained.

Whatever be our theory of tic, whatever be the shape the individual tic assumes, it is in essence always a perturbation of motility, corresponding to a psychical defect. No doubt appearances are deceptive, and the brilliance of the subject's natural gifts may mask his failings. His intelligence may be high, his imagination fertile, his mind apt, alert, and original, and it may require painstaking investigation to reveal shortcomings none the less real. This practice we have scrupulously observed in all the cases that have come under our notice, and we believe that the information gleaned in this way, coupled with the results of previous workers, warrants the attempt at a systematic description of the mental state common to all who tic.

Charcot[2] had already remarked the presence of certain signs or psychical stigmata indicative of degeneration, or of instability, as he preferred to say, inasmuch as the mental anomalies of these so-called

[1] MAGNAN, *Recherches sur les centres nerveux*, 2nd series, p. 116.

[2] CHARCOT, *Leçons du mardi*, October 23, 1888.

degenerates were not only frequently unobtrusive, but in a great many cases associated with intellectual faculties of the first order. His contention has been amplified by Ballet:[1]

> The striking feature of these "superior degenerates" or "unstables" is not the insufficiency, but the inequality, of their mental development. Their aptitude for art, literature, poetry, less often for science, is sometimes remarkable; they may fill a prominent place in society; many are men of talent, some even of genius; yet what surprises is the embryonic condition of one or other of their faculties. Brilliance of memory or of conversational gifts may be counteracted by absolute lack of judgment; solidity of intellect may be neutralised by more or less complete absence of moral sense.

In the category of "superior degenerates"—to use Ballet's terminology—will be found the vast majority of sufferers from tic, of whom O. may serve for the model. A no less instructive example is that of J.:

> Of superior intelligence, lively disposition, and ingenious turn of mind. J. is dowered with unusual capabilities for assimilation. Everything comes easy to him. At school he was one of the foremost pupils, and his work elicited only expressions of praise. He is both musical and poetical; his quickness and neatness of hand find outlet in his passion for electricity and photography; for mathematics alone he has little inclination.

In a word, as with physical imperfection, so with mental—it may consist either in absence, arrest, or delay, or in overgrowth, increase, exaggeration, and these contrary processes may co-exist in the same individual. Sufficient stress, however, has not been laid on a practically constant feature in the character of the *tiqueur*—viz. his *mental infantilism*, evidenced, as was noted by Itard in 1825, by inconsequence of ideas and fickleness of mind, reminiscent of early youth and unaltered with the attainment of years of discretion. We must remember that imperfection of mental equilibrium is normal in the child, and

[1] BALLET, *Traité de médecine*, vol. vi. p. 1158.

that perfection comes with adolescence. In the infant cortico-spinal anastomoses are awanting, and volitional power is dependent on their establishment and development. At first, cortical intervention is inharmonious and unequal: the child is vacillating and volatile; he is a creature of sudden desire and transient caprice; he turns lightly from one interest to another, and is incapable of sustained effort; at once timid and rash, artless and obstinate, he laughs or cries on the least provocation; his loves and his hates are alike unbounded.

These traits in the child's character pertain equally to the patient with tic, in whom retarded or arrested development of volition, physical and mental evolution otherwise being normal, is the principal cause of faulty mental balance. That this view is correct may be inferred from a comparison of the individual patient with healthy subjects of his own age. The chief element in mental infantilism is maldevelopment of the will. While in the child deficiency of what one might call mental ballast is usually atoned for by well-conceived discipline and education, it is accentuated by misdirected teaching. Now, it not infrequently happens that the upbringing of the predisposed to tic is not all that might be desired, seeing that mental defect on the part of the parents renders them unsuitable as instructors of youth. Parental indulgence or injustice is the fertile source of ill-bred or spoiled children, in whom, spite of years, persist the mental peculiarities proper to childhood. From the ranks of these spoiled children is recruited the company of those who tic, for tics, generally speaking, are nothing more than bad habits, which, in the absence of all restraining influence, negligence and weakness on the side of the parents have allowed to degenerate into veritable infirmities. These the patients themselves are in-

capable of inhibiting, for whatever be their age, they remain "big children," badly bred and capricious, and ignorant of any self-control. Hence one of the first indications in their treatment is to submit them to a firm psychical discipline, calculated specially to strengthen their hold over their voluntary acts. Take the following case:

J. is nineteen years old, intelligent, educated, ready to graduate were it not for the interruptions his studies have undergone, and to all appearance arrived at manhood's estate. None the less he presents to-day the mental condition of nine years ago: he is fickle, pusillanimous, naïve, emotional; he laughs at trifles and is provoked to tears at the first harsh word; his nature is restless, his mind inconsequential; he is by turns elated or depressed for the most trivial of reasons. Notwithstanding his seventy-one inches, he must still be fed, dressed, and put to bed by his mother!

An identical mental state obtains in infantilism properly so called, where to arrest of mental development physical imperfection is superadded. In cases of infantilism the psychical level corresponds more or less intimately to the somatic level, an observation borne out in the case of J.:

From the morphological point of view he shows one or two stigmata of infantilism: his great height need not be held to disprove this, for gigantism and retardation of sexual development are often in association. In spite of his nineteen years, J. has still a eunuch's voice and a minimum of axillary and pubic hair—in fact, one might say that physically he is thirteen years old, and mentally ten.

Or take Mademoiselle R., aged twenty-six:

Her intellectual attainments are those of a child of twelve, her age when her first tics made their appearance. Her artlessness and timidity are simply childish, and at the same time she lacks womanly charm and feminine ways.

Or again:

Young thirteen-year-old M. has been afflicted with tics of face, head, and shoulders for the last three years. Though small, he is well

enough built, and has no obvious physical anomaly except an odd admixture of blonde and brown in his hair and eyebrows. His teeth are bad and misplaced, and several of the first dentition persist. There is no sign of pubic or axillary growth. As a general rule he is mild-mannered and docile; sometimes, however, he is irritable, impatient, emotional beyond his years. His degree of intelligence is very fair, but idleness and inconstancy are prominent traits in his character. The ease with which he apprehends is counterbalanced by the readiness with which he forgets, while his reason and judgment are those of a child of seven. The discordance between his actual age and his mental standard is therefore striking enough.

Another of our patients is L.:

Her intellect is quite up to the average, but the exaggerated importance attached by her parents to her "nervous movements" has only served to intensify her whims. Her eighteen years do not prevent her from revealing signs of mental infantilism in every action of her daily life, but, thanks to suitable treatment, she has been astonishing her father by unheard-of audacities—has she not recently ventured to cross the street alone, and alone to go an errand to a neighbouring shop?

X. has a tic of the eyes and has reached the age of forty-eight, yet he told us he was not so much his children's father as their playmate. At the age of fifty-four O. could still remark on his youthfulness of character. The same is true of S., who has attained his thirty-eighth year.

It is as arduous a task to define the term "stability of the will," as it is to explain what is meant by physical or mental health. But as it is not essential to preface descriptions of disease with a disquisition on the signs of good health, so anomalies of voluntary activity may surely be noted without a preliminary excursus on normal volition.

Will power may deviate from the normal in either of two directions—in the direction of excess or of insufficiency. To both of these two forms of volitional disturbance the subjects of tic have become slaves. Weakness of will is seen in irresoluteness of mind,

flight of ideas, want of perseverance; exuberance of will in sudden vagary or imperious caprice. The man who tics has both the debility and the impulsiveness of the child; to his impatience his incapacity for sustained effort acts as a set-off; he is impressionable, wavering, thoughtless, even as he is mettlesome and irascible. He does not know how to will; he wills too much or too little, too quickly, too restrictedly.

As a single example of volitional activity, let us take the attention. Diminution of attention on the part of tic patients has been judiciously commented on by Guinon:

> It is impossible for them to address themselves to any subject: they skip unceasingly from one idea to another, and apply themselves with zest to some occupation only to forget it immediately. No further proof of this need be sought than the inability of the patient, if he be at all severely affected, to read, a proceeding at once intellectual and mechanical, and absolutely familiar to most. Read the patient cannot, and though the attempt to concentrate the attention diminishes or inhibits the tic at once, there is no sequence in his effort; his eye jumps erratically from one line to another, and his many unavailing trials end in his throwing the book away.

Excess of voluntary activity is disclosed in the whole series of impulsions.

The germ of homicidal or suicidal tendencies, which we have indicated in the case of O., is discoverable also in one of Charcot's patients.[1]

> *M. Charcot* (to the patient)—Tell us what you said the other day about razors.
>
> *The Patient*—Whenever I see a razor or a knife, I begin to thrill and feel afraid. I imagine I am going to kill some one, or that some one is going to kill me. I have the same sensation when I see a gun, or even if the notion of a gun comes to my mind. The mere thought of it agonises me. The fancy of murdering some one strikes me, and up to a certain point I am envious of fulfilling the desire. Often I am conscious of an irresistible longing to fight somebody, and I am

[1] CHARCOT, *Leçons du mardi*, October 23, 1889.

frequently impelled to it by the sight of a cabman. Why a cabman more than any one else, I have not the remotest idea.

We have already touched on the close affinity between an act and the idea of the act, and we have emphasised the absence of any appreciable interval between the idea and its execution, unless the brake of volitional interference be put on at the proper moment. It is in these circumstances that the feeble of will betray their debility; the inadequateness or inopportuneness of their will's activity allows the performance of the act they would fain repress.

A no less characteristic feature of the subject of tic is his impatience.

J. bolts his food without waiting to masticate it, and the instant his plate is empty jumps up from the table to walk about the house. He returns for the next course, which he swallows as precipitately; delay makes him impatient, and all are forced to rush as he does. Meal time for the whole family has become a perfect punishment. Alarmed enough already at his tics, the parents are terror-stricken by the tyrannical caprices of this big baby, who outvies the worst of spoilt children in his behaviour.

Mental instability is not uncommonly associated with a general restlessness and fidgetiness during intervals of respite from the actual tics. The patient experiences a singular difficulty in maintaining repose. Every minute he is moving his finger, his foot, his arm, his head. He passes his hand over his forehead, runs his fingers through his hair, rubs his eyes or his lips, ruffles his clothes, plays with his handkerchief or with anything within reach, crosses and uncrosses his legs, etc. None of these gestures can properly be considered a tic, for, however frequent be its repetition, it is neither inevitable nor invariable. If they are superfluous and out of place, the absence of exaggeration or absurdity negatives their classification as choreic. They are a

sign not so much of motor hyperactivity as of volitional inactivity. They are tics in embryo.

The patient's emotions are similarly ill balanced. Any rearrangement in his habits he finds disconcerting; he is upset by an unexpected word, a deed, a look; his timidity and sensitiveness are extreme—fertile soil for the development of tics.

So, too, with his affections, his likes and dislikes, his friendships and enmities—there is commonly a disproportion about them that betokens mental deficiency. At one time it is fear or repulsion that actuates him; at another it is an unnatural tenderness, a sort of *philia*, if the term may be allowed.

Anomalies such as these, however, are met with in all the mentally unstable, and do not present any special feature when they occur in those who tic.

An acquaintance with the mental state of our patients enables us to understand the mode their tic adopts. As one thinks, so does one tic. To the transiency and mutability of the child's ideas correspond what are known as variable tics, which rarely have a definite localisation, and become fixed only when certain ideas become preponderant. The existence of a solitary tic, however, is not at variance with that disposition we have qualified as infantile, for mental infantilism is the original stock; on it, as a matter of fact, may be grafted further mental disorders in the shape of fixed ideas, phobias, or obsessions.

Should a fixed idea entail a motor reaction, it may give rise to a tic as ineradicable as the idea itself, and a series of fixed ideas may be accompanied by a succession of corresponding tics.

The frequency with which obsessions, or at least a proclivity for them, and tics are associated, cannot be a simple coincidence. Without defining the word obsession, let us be content to recall the excellent classification

given by Régis, according to whom they mark a flaw in voluntary power, either of inhibition or of action. On the one hand we have *impulsive obsessions*, subdivided into obsessions of indecision, such as ordinary *folie du doute*; of fear, such as agoraphobia; of propensity, such as those of suicide or homicide. On the other we find the *aboulic obsessions*, such as inability to stand up (ananastasia), or to climb up (ananabasia), or the astasia-abasia of Séglas, or the akathisia of Haskowec. Perhaps we ought also to place here sensory obsessions in the shape of topoalgia, and even hallucinatory affections.

In all these varieties of obsession increase or diminution of volitional activity is undeniable. But this alteration in the function of the will is no less distinctive of tic, and if we compare the psychical stigmata of obsessional patients—the asymmetry of their mental development, their intellectual inequalities and lack of harmony, their alternating excitability and depression, their unconventionalities, eccentricities, and imaginativeness, their timidity, whimsicalness, sensitiveness, and all the other indications of a psychopathic constitution—if these are compared with the mental equipment of the sufferer from tic, we cannot but notice intimate analogies between the two, analogies corroborated by a glance at their symptomatology.

An obsession may be of idiopathic origin, or it may be causally connected with some particular incident, sensation, or emotion. A conflagration may determine fear of fire, or a carriage accident amaxophobia. Further, the obsession is irresistible, as is the tic: opposition endures but for a moment, and is therefore vain. Nor is the inhibitory value of attention or distraction any less ephemeral. This feature of tic was noted as long ago as 1850 by Roth, who held its motor manifestations to be phenomena of "irresistible musculation."

Consciousness is maintained in its integrity both before and after, but not during, an obsessional attack, and this is equally true of tic, as are the preliminary discomfort and subsequent satisfaction that attend the obsession. Noir makes the appropriate remark that idiots affected with krouomania, in whom sensory disturbance is awanting, so far from suffering pain through sundry self-inflicted blows and mutilations, seem, on the contrary, to be thus afforded a certain feeling of relief, if not of actual relish.

Whenever Lam., who exhibits incessant balancing and rotatory movements of the head, is seated in proximity to a wall, he knocks his head sideways against it until a bruise results, and appears to find therein a source of genuine satisfaction.[1]

If, then, an obsession provokes a motor reaction at all, it may originate a tic, and, in the case of tonic tics, this is a very common mode of derivation, as one may well understand how an obsession may occasion an attitude.

Grasset cites the example of a young girl who would never lean backwards in a railway carriage or on any chair or bench, preferring to sit bolt upright on the edge. In this instance the adoption of a stereotyped attitude was directly attributable to an obsession.

Another example of an attitude tic is furnished by the case of young J.:

Standing or seated, he always has his half-flexed left arm firmly pressed against the body in the position assumed by hemiplegics. Its pose and inertia and the awkwardness of its movements unite to suggest some real affection, the existence of which the constant use of the right arm and the elaboration by the patient of intricate devices to obviate disturbing the other tend to substantiate. Nevertheless, the impotence is entirely imaginary. To order he can execute any movement of the left arm with energy and accuracy; his left hand will button or unbutton his clothes, lace his boot, handle a knife, and even hold a pen and write.

[1] NOIR, *Thèse de Paris*, obs. xviii. p. 40.

It seems that the position of the arm was chosen deliberately to alleviate a supposed pain in the shoulder, and unceasing resort to this subterfuge of his own inventing, which he considered a sovereign remedy, ended in its voluntary adoption being succeeded by its automatic reproduction.

The assumption of this position for his arm was at first attended with satisfactory results, but, as might have been foreseen, its inhibitory value decreased gradually, so he had recourse to other means. It was then that the right hand was made to grip the left and press it more energetically than ever against the epigastrium. In this complex attitude both arms simultaneously participated, but again its efficacy was purely transitory. Evidently dissatisfied with his methods of immobilisation, and convinced that experimentation would end in the discovery of the desired arrangement, J. proceeded to employ the right hand in impressing every variety of passive movement on the left hand, wrist, forearm, and upper arm, and soon there was no checking these gymnastic exercises. He would suddenly grasp the wrist and pull and screw it, while the left shoulder and elbow resisted nobly; or he would bend, or unbend, or twist his fingers, or seize the arm below the axilla and knead it or rub it, forcing it against or away from the thorax; he would pound the muscles and pinch the tendons, sometimes in a brutal fashion; in short, the situation degenerated into nothing more nor less than a pitched battle between the left arm and the right hand, in which the latter endeavoured by a thousand tricks to bring the former into subjection. Victory rested always with the affected arm.

Each time that this absurd combat recommenced, the patient experienced a sensation of relief; resignation to the imperious motor obsession was even followed by a sense of well-being. On the other hand, resistance was accompanied by actual anguish—he would fidget desperately in his chair, cross and uncross his legs, sigh, grimace, rub his eyes, bite his lips and nails, twist his mouth about, pull at his hair or his moustache, he would look anxious or alarmed, would become by turns red or pale, and beads of perspiration would gather on his face. At length he would be compelled to yield, and the bloodless battle of his upper limbs would close more furiously than ever.

In this case the typical features of obsession are excellently illustrated—its irresistibility, as well as the concomitant distress and succeeding content.

Conversely, however, a tic may be said to develop into an obsession if the exciting cause of the latter be the motor reaction.

In various psychopathic conditions (says Dupré[1]), especially where the genito-urinary apparatus is concerned, this pathogenic mechanism is encountered. Some source of peripheral irritation in bladder, urethra, prostate, etc., provokes cortical reaction, and a reflex arc is established with centrifugal manifestations in the guise of motor phenomena, which in their turn originate all sorts of fixed ideas, impulsions, and obsessions, forming an integral part of the syndrome.

There is frequently no direct or obvious connection between a patient's obsession or obsessions and his tics. The former may consist, both in children and in adults, in extraordinary scrupulousness, perpetual fear of doing wrong, absolute lack of self-confidence, sometimes simply in excessive timidity, exaggerated daintiness, or interminable hesitation. We have often seen youthful subjects betray in their disposition weak elements such as the above, which at a later stage have proved the starting-point for more definite obsessions. Their intelligence and capacity for work earn the approbation of their teacher, yet they are for ever dissatisfied, haunted by the dread of having overlooked some iota in their task; they dare not affirm that they know their lessons, they stammer over their answers, mistrust their memory, make no promises and take no pledges, and thus bear witness to an absence of confidence in themselves which affects them profoundly, for they are well enough aware of its consequences.

An admirable instance of this is furnished by the case of young F., or by little G., ten years old, who suffers from a facial tic, and constantly hesitates when asked to give a measurement, an hour, a date, a figure, solely by reason of a conscientious fear of not being absolutely accurate in his reply.

In children the emotional excitement of their first Communion often favours the development of religious scruples. By a sort of metastasis, diminution of the

[1] DUPRÉ, *Soc. de neur. de Paris*, April 18, 1901.

convulsive movements goes *pari passu* with aggravation of the mental phenomena, until such a time as the devotional exercises are done with, when there is a return to the previous state.

Arithmomania betokens an analogous turn of mind. Certain patients are compelled to count up to some number before performing any act. One cannot rise from his seat without counting one, two, three, four, five, seven, leaving out six since it is disagreeable to him. Another must repeat the same movement two, three, ten times, must turn the door-handle ten times ere opening it, must take five steps in a circle before beginning to walk (Guinon). A patient of Charcot's used insanely to count one, two, three, four, used to look under his bed three or four times, and could not lie down until assured that his door was bolted. A further example is reported by Dubois:

> A young woman twenty years of age first began to suffer from convulsive tics five years ago. Without any warning she used to bend down as if with the intention of picking up something, but she had to touch the ground with the back of her hand, else the performance was repeated. Twenty or thirty times a day this act was gone through; in the intervals she kept turning her head to the right, looking up at the curtains in a corner of the window, and at the same time making a low clucking sound that attracted the attention of those in the room. For nine or ten years these two tics have prevailed, and have been accompanied with certain obsessions, such as the impulse to count up to three, to regard any person or object three times, etc. With the generalisation of the convulsive movements various phobias have made their appearance—viz. fear of horned animals, of earthworms, of cats, of blight, etc.

Onomatomania is another form of obsession which may be mentioned, exemplified by the dread of uttering some forbidden word, or by the impulse to intercalate some other. The term *folie du pourquoi* has been applied to the irresistible habit of some to unearth an explanation for the most commonplace of facts: "Why has this coat six buttons?" "Why is so-and-so blonde?"

"Why is Paris on the Seine?" etc. This mode of obsession is frequent among those who tic, and is curiously reminiscent of a familiar trait in the character of children, thereby supporting our contention of the mental infantilism of all affected with tics.

Prominent among the mental anomalies of the subjects of tic are found different sorts of phobia: fear of death or of sickness, of water, knives, firearms—topophobia, agoraphobia, claustrophobia, etc.

The following most instructive case has been observed by one of us over a period of several months:

S.'s earliest attack of torticollis, of two or three days' duration merely, occurred when he was fifteen years old, and was attributed by his mother—whose mental peculiarities, in especial her fear of draughts, are no less salient than those of her son—to a chill occasioned by a flake of snow falling on his neck. S. is so blindly submissive that he accepts this pathogeny without reserve. Five years ago a second torticollis supervened, which still persists to-day, and of which his explanation is that he was obliged, when standing at a desk, to turn his head constantly to the left for two hours at a time in order to see the figures that he had to copy, and was forced, after the elapse of some months, to relinquish his work owing to pain in the occipital region and neck. From that moment dates the rotation of his head to the left.

At the present time his head is turned to the left to the maximum extent, the homolateral shoulder is elevated somewhat, and the trunk itself inclines a little in the same direction. The permanent nature of this attitude necessitates his rotating through a quarter of a circle on his own axis if he wishes to look to the right. On the latter side the sternomastoid stands out very prominently, and effectually prevents his bringing the head round; nevertheless he is greatly apprehensive of this happening, and as he walks along a pavement with houses on his right he keeps edging away from them, since he is afraid of knocking himself against them. By a curious inversion, common enough in this class of phobia, he feels himself impelled to approach, with the result that he cannons against the wall on his right as he proceeds.

Contrary to the habit some patients with mental torticollis have of endeavouring to ameliorate the vicious position by the aid of high starched collars, S. has progressively reduced the height of his until he has finished by discarding them altogether. As a matter of fact, it is the "swelling" in the neck caused by the right sternomastoid that is at the

root of his nervousness, for he is convinced that it preceded the onset of the torticollis, and he has a mortal dread of aggravating it by compression.

Hence one may perhaps understand what line of erroneous reasoning has led to the establishment of the wryneck. The fear of draughts, instilled in his youthful mind by his mother, had the effect of driving him to half-strangle himself with a tightly drawn neckerchief, to hinder the inlet of air and minimise the risk of catching cold, and when he commenced to turn his head to the left at his work, the pressure of the band round his neck was felt most of all on the contracted right sternomastoid. A glance at a mirror convinced him that the unusual sensation was due to an abnormal muscular "swelling," whereat he was vastly alarmed; he hastened to change his collar, but all to no purpose. By dint of feverish examination and palpation of the muscle, he soon acquired the habit of contracting it in season and out of season, till at length an unmistakable mental torticollis supervened.

It sufficed to explain to S. the rôle played by the sternomastoid in head rotation, and to demonstrate the absurdity of his interpretation of the so-called "swelling": the gradual relaxation of the muscle and consequent diminution in the "tumour's" size not only satisfied him of its benign nature, but afforded such a sense of relief as was quickly made obvious by a notable improvement in his condition.

A singular tic of genuflexion occurred in a case reported by Oddo, of Marseilles:

> The dominant note in the young girl's character is her cowardice; she is afraid of everything. Every evening before the return of her father she repeatedly looks into the corridor to see that no one is there; as soon as her parent arrives, she locks the door behind him hurriedly to prevent any one else appearing; every now and then in her fear of a footstep she listens at the door, and it is this gesture, this attitude of listening, that has degenerated into a tic which no amount of remonstrance or derision seems to affect.

Phobias such as these are associated with an evident tendency to melancholia and hypochondriasis. The majority of our patients are ridiculously preoccupied with the state of their health; the extraordinarily introspective nature of their minds is manifest in their meticulous observation, their laborious analysis of their most trifling sensations, the zeal with which they devise

the most complex explanation for their simplest symptom, usually for the sake of making the prognosis seem more grave.

At the other pole from these silly fears and dislikes we meet with various absurd predilections and meaningless attractions: one can sit only on a certain seat, sleep only in a certain bed; another cannot enter a room except by a particular door; a third will make a long detour to pass along a certain street; in this street he will always walk on the same side, and lengthen or shorten his stride to step always on the same flagstones. We are acquainted with the history of a wretched commissionaire who could not go an errand in Paris without starting from the Place Clichy, and the interminable twists and turns on his route can be imagined when his duty took him from Montrouge to the Bastille.

Akin to the conditions we have been enumerating is an exaggerated love of order, somewhat unexpected in those whose mental disarray is often extreme. Some cannot sleep without previously arranging their clothes in an unvarying plan. One of Guinon's patients contrived to have one half of the objects in front of him to his right, and the other half to his left. In the case of a little nine-year-old hydrocephalic child with tics and echolalia, Noir[1] makes the following remarks:

> The fundamental element in the child's character is an overweening vanity coupled with an excessive orderliness. Her desire of personal ornament is such that at one time she is lost in admiration of a new dress, at another, she is decking herself out with old pieces of tarletan. When going to bed she folds her clothes in the same exact order each evening. Her self-conceit makes her furiously jealous of the attention paid to any other patient in her presence.

A similar mental state has been observed by Noir in other hydrocephalics.

[1] NOIR, *Thèse de Paris*, obs. lix. p. 121.

The same tendency is revealed in an inane search after precision in the most petty details, the natural result in the case of conversation, for instance, being that its thread is quickly lost in endless digressions and parentheses within parentheses.

A score of other mental peculiarities, commonly described as "manias" by the lay mind, are nothing else than fixed or obsessional ideas in miniature, as Grasset says, and he narrates how for a time he himself used to be irresistibly forced, on entering a railway carriage, to divide the figure representing the number of the carriage by the number of the compartment. He further cites the case of an otherwise normal individual, who whenever one foot strikes on a stone raised a little above the level of the ground, is obliged to seek an analogous sensation for the other, and who cannot let one hand touch anything cold without giving its fellow the opportunity of receiving an identical impression. A common impulse is to count the windows in the house one is passing, or the bars of the railings. Sometimes it is a "mania" for setting things straight, or for rubbing out marks in a book; but while these and similar psychical accidents are singularly prone to develop in the subjects of tic, they are not to be considered in any way special to them.

Hallucinations, too, and sometimes actual delusions, may form a basis from which springs a motor reaction that passes into a tic.

If even the most sane among us (says Letulle) are conscious of a wellnigh invincible propensity to repeat a particular movement or expression or sequence of thought, we can understand how the temptation falls with overwhelming force on such as suffer from persistent hallucinations or fixed ideas. Take, for instance, this woman who utters a shrill cry and waves her hand before her face; the regularity of her action is a sequel to the delusion that possesses her, for in her imagination she is chasing away the birds that would pluck out her eyes. And when

at a later stage these visual hallucinations are lost in a progressive dementia, the gesture becomes an incurable tic.

Here is another patient : his habits of continually washing his hands, of expectorating as he passes any one, have their explanation in his dread of being poisoned by imaginary foes, and, though subsequent mental disintegration precludes the possibility of the delusion continuing, the trick remains to the end of life.

A case has been put on record by Wille,[1] under the name of "disease of impulsive tics," concerning a young man twenty-two years of age, who, in addition to the grave taint of a psychopathic heredity, exhibited early indications of irritability and a tendency to obsessions. Systematised movements of face, shoulders, and arms, accompanied with coprolalia, were not long in appearing. It was noticed that the psychical symptoms were periodic, and that their nocturnal exacerbation coincided with the advent of hallucinations. Two attacks of mania came on, but a cure followed after four years' time.

It may be questioned whether we are not dealing here with a case of dementia præcox, rather than with the true Gilles de la Tourette's disease; at any rate, tic may be a concomitant of grievous mental affections.

Another case of still more advanced mental deterioration may be quoted from Bresler : [2]

In this patient contractions of facial and limb musculature at the age of nine were succeeded by some years of epileptic outbreaks ; and outrageous conduct towards his mother and sister, coupled with acts of wanton brutality and destruction, at length necessitated his removal to an asylum. He suffers from convulsive tic of face and shoulders, while his speech is drawling and syllabic, and interrupted by guttural ejaculations corresponding to the manifestations of his tic.

It is superfluous to dilate further on this part of our subject, and we shall take another opportunity of dealing with the question of tics in idiots and the mentally

[1] WILLE, *Monatschr. f. Psychiat. u. Neurol.* 1898, p. 210 ; 1899, p. 873.

[2] BRESLER, "Beitrag zur Lehre von der Maladie des Tics convulsifs," *Neurolog. Centralb.* 1896, p. 965.

backward. For the present, the statements of the chapter may be summarised in a few words:

In the mental condition of the subject of tic there may be differentiated two elements: the one is fundamental, and is sufficiently described in the phrase mental infantilism; the other is superadded, and consists of a multiplicity of psychical imperfections which reveal, at the same time as they exaggerate, the inherent defects constituting the former, in particular volitional infirmity. By this means a useful clinical distinction may be drawn between various tics, according as they take their rise in one or other form of mental affection, and at the same time the practical gain is considerable, for treatment must be directed both to the physical and the psychical aspect of the malady, and its success in the former sphere is greatly dependent on intelligent recognition of and acquaintance with the nature of the latter.

Manias, obsessions, phobias, and other accompaniments of the disease known as tic (says Grasset)—those abnormal phenomena that testify to the affection as the stigmata of hysteria confirm that neurosis—are nothing more than psychical tics; that is to say, special types of the disease. If their occurrence is frequent and indeed habitual, their absence in no way invalidates the diagnosis. They resemble coprolalia, salutations, etc., in being accidental and not essential symptoms.

We are entirely at one with Grasset on this last point; but if they do occur, are they to be denominated tics? We must beg to be excused for dwelling with such insistence on a question of words, but we are assured that the rigorous limitation of the word tic to conditions in which it is possible to recognise two inseparable and indispensable elements, one motor and the other mental, cannot fail to simplify matters. Otherwise, of course, we are merely adding to the meaning of a term already interpreted in far too liberal a fashion.

Abuse of language such as this leads to inevitable confusion. Noir, for an instance, in whose excellent

thesis there is abundant evidence of painstaking observation and judicious discernment, is constrained to write:

*Tics of idea* are exemplified by fixed and obsessional ideas, such as *folie du doute*, misophobia, arithmomania, etc., and are allied to motor tics in that they consist of isolated or complex psychomotor reactions, which may, however, assume a purely psychical form. They are mental affections clothed, in the case of convulsive tic, in a motor garb.

In our opinion, all such formulas as "tic of idea," "psychical tic," "mental tic," "motor tic," etc., ought to be abolished. An obsession ought to be called an obsession, and there ought to be a similar understanding in the case of phobias and fixed ideas, for each and all may exist independently of any motor reaction whatever, and therefore can never be classed with tic. It is only when the obsession or the fixed idea entails the automatic repetition of some motor phenomenon that a syndrome can be constituted to which the name of tic may be applied. As a matter of fact, a tic can no more be exclusively mental than exclusively muscular. A mental condition that does not find expression in a motor reaction is not a tic, and to speak of purely mental or purely motor tics is a contradiction in terms. Cruchet's proposed category of *psycho-mental* tics serves only to aggravate the misunderstanding, so long as everyday usage emphasises the identity of the two words "psychical" and "mental."

[Tics are not the private property of the human species. The word appears to have been first employed in reference to horses, and while little attention has hitherto been paid to the subject in veterinary annals, its methodical study has recently been undertaken by Rudler and Chomel.[1] It is remarkable how intimate are

[1] RUDLER AND CHOMEL, "Tic de l'ours chez le cheval," *Rev. neur.* 1903, p. 541; "Analogies entre les tics de léchage chez l'homme et chez le cheval," *Soc. de neur. de Paris*, January 7, 1904; "Des stigmates de la dégénérescence chez l'animal," *Congrès de Pau*, 1904; *Nouv. icon. de la Salpêtrière*, 1904, p. 471.

the analogies established by these observers not merely between the tics of animals and of mankind, but also between their respective mental conditions. Physical and psychical stigmata of degeneration are as obvious in the horse that tics as in the man who tics, and it is not without interest to note that the tics of such animals as have the most rudimentary psychical development present a close resemblance to those that occur among the least advanced of the human race, among idiots and imbeciles.]

## CHAPTER V

### THE ETIOLOGY OF TICS

THE circumstances favouring development of a tic in soil already prepared by psychical predisposition are manifold. Our studies in the pathogenesis of tic have illustrated the significance of exciting causes, so-called. We have seen how the motor part of the tic was originally directed to some definite object, and therefore provoked by some definite cause, and how the eventual disappearance of this cause does not justify the conclusion that it has never existed.

We shall be able to quote numerous instances in point when dealing with the different localisations assumed by the tics; what we wish to remark here is that the initial cause is by no means always easy to ascertain. The subjects of whom we are treating exhibit a vexatious tendency to invent a more or less fantastic etiology for themselves, and their statements cannot be accepted without rigorous investigation. Of any actual exciting cause they may be really ignorant, or more likely oblivious.

In this connection an important case is reported by Pierre Janet[1]:

> A young man twenty-five years old was affected with a facial tic in the shape of constant grimaces, accompanied by violent expirations through one nostril. Six years of the condition had neither enabled him to determine its origin nor brought him any relief. He presented, in addition, the phenomena of automatic writing and was the subject

[1] JANET, *Névroses et idées fixes*, vol. i. p. 397.

of somnambulism, and when in the latter state explained that the tic arose from the effort to expel an irritating nasal obstruction due to an epistaxis six years ago.

Needless to say (adds Janet), there never had been any obstruction in the nose; the truth was that in the somnambulistic state he was reminded of a subconscious fixed idea of which he was ordinarily unaware.

Recognition of the causal factor, then, is not without value, as otherwise the tic's situation and form may rest inexplicable.

These exciting causes we shall discuss more closely at a subsequent stage, confining our attention for the present to one or two general considerations.

*Age.*—Tics may occur at any period, except in infancy. "Nervous movements" appearing previous to the age of three or four cannot be tics, as has been made plain in the chapter on pathogeny. It is only with the development of psychical function—about the age of seven or eight—that revelation of its imperfection, if such exist, becomes possible.

Initiation or exacerbation of a tic is very frequent about the time of puberty, when both physical and mental evolution is peculiarly apt to suffer interruption.

*Sex.*—Sex is without influence on the disease.

*Race.*—In spite of the absence of precise statistics on the subject, the opinion that the tendency to tic increases with the advance of civilisation is not, we think, premature.

We have had the curiosity to interrogate several travellers familiar with different savage tribes of Central Africa, who, although notified beforehand to be on the look-out, declare they have practically never met with tic in negroes. These observations require to be confirmed.

It may be questioned if the level of mental attainment of such primitive peoples is sufficiently high to

allow of the establishment of tics. Their occurrence in the lower animals has been recorded, it is true; but with our ignorance of what constitutes an animal tic, and until further information is forthcoming, it is prudent not to speculate on these matters. We must be content with the remark that savages and animals are less exposed than the civilised to circumstances facilitating the development of mental instability.

*Trauma* and *infectious disease* may provide the occasion for either the appearance or the disappearance of a tic, but of themselves they are incapable of originating the affection.

One of Noir's patients had a brother similarly afflicted, and a sister in whom an attack of bronchitis at the age of five was accompanied by tics of arm and head, which recurred subsequently in an exaggerated form during smallpox. On each of two occasions on which J. suffered from influenza his tics increased in violence and extent; while in the case of G. aggravation heralded the approach of measles.

Young M., on the other hand, remained free of all his face and head movements during the immobilisation of a fractured leg, with the cure of which his tics returned.

To disturbance of the reproductive organs, in particular to uterine disorders and even pregnancy (Gowers, Bernhardt), has been ascribed the onset of tic.

Of the possible influence of climate, season, and atmospheric change in general, precise information is lacking. Stormy weather or a falling barometer frequently exercises a depressing effect on the subjects of tic, but this is habitual in all neuropathic individuals. Oppenheim declares he has seen severe cases of convulsive tic follow an earthquake.

*Heredity.*—To this Charcot used to attach the greatest importance. In every case of tic, he main-

tained,[1] however trivial, especially if attended with phenomena such as coprolalia, a hereditary element is discernible.

Similar heredity is of common occurrence. In Gintrac's cases, two brothers had the same facial tic. Blache's patients were three children in the same family. Delasiauve observed identical tics in brother and sister, and Piedagnel in mother and daughter. A father and two sons of whom Letulle has given an account all suffered from a tic of blinking. The same author has seen two brothers with a complex tic of face, scalp, arms, and diaphragm. More recently Tissié has recorded a series where a mother was affected with ocular tic, while the eldest son also had an ocular tic, which eventually spread to the face and was associated with a spasmodic cough; a younger son was likewise the subject of ocular tic.

A case has come under our notice of a young girl with a head-tossing tic which had been preceded by a variety of others now imitated by her youngest sister, such as sniffing, screwing of the face, shaking of the shoulders, abrupt pulling up of the garters, etc.

These and similar instances undoubtedly serve to show the effect of hereditary predisposition; but the element of imitation enters no less into the question, and the elimination of its influence, owing to family promiscuousness, is peculiarly arduous. To this point we shall revert immediately.

Dissimilar heredity, in any of its forms, neuropathic or psychopathic, is no less frequently met with, and emphasises the kinship of tic with almost all the psychoses and neuroses.

It is a matter of common observation for a *tiqueur's* father to be a neuropath, his mother a hysteric, his brother an epileptic, or his grandfather a general

[1] CHARCOT, *Leçons du mardi*, December 13, 1887.

paralytic or a maniac, while neurasthenia, hypochondriasis, psychasthenia, etc., or organic disease of the nervous system, may occur among the collaterals. A case has been under our care of a boy M., who has two brothers and one sister, all in good health. The sister bites her nails. The mother is normal, but excessively weak where her children are concerned. The father is neurasthenic, and the grandfather has trigeminal neuralgia.

Occasionally a family history of syphilis or alcoholism is forthcoming. Sometimes tic and psychical troubles alternate. Flatau[1] quotes a case of a mother with impulsions and a son with tics, and another of a mother and sister who tic, with a son possessed of fixed ideas.

In the subjects of tic and in their families, mental instability and intellectual superiority have repeatedly been conjoined. To refer again to the case of young J., no particular deviation from the normal was traceable on the part of any ancestor or relative on the paternal side, except that the father himself was unusually emotional and a prey to scruples; but the mother's whole family were either brilliantly clever or prematurely broken down, succumbing to "strokes" and paralyses of various kinds.

Many figures celebrated in history had their tic.

> At the time of his early appearances Molière was held even in the provinces to be a comedian of a very inferior order, owing perhaps to a hiccough or throat tic of his leaving a disagreeable impression of his acting on those who were not aware of its existence.[2]

Brissaud recalls the curious picture of Peter the Great handed down to us by Saint-Simon[3]:

[1] FLATAU, *Centralb. f. Nervenheilk.*, August, 1897.

[2] *Vie de Molière*, 1705, pp. 206-7 (quoted by Cruchet).

[3] *Mémoires de Saint-Simon*, year 1707, vol. xiv. p. 427 (Hachette, 1857).

If he gave thought thereto, his mien became majestic and gracious, else was it forbidding, and almost savage, his eyes and his face occasionally distorted by a momentary tic that rendered his expression wild and terrible.

Similarly with the Emperor Napoleon[1]:

His moments, or rather his long hours, of work and meditation were characterised by the exhibition of a tic consisting in frequent and rapid elevation of the right shoulder, which those who did not know him sometimes interpreted as a sign of dissatisfaction and disapproval, seeking uneasily wherein they could have failed to please him.

Cases of tic in the descendants of great men are far from rare; we have met with several instances.

Among etiological factors of a general description, the rôle played by *imitation* is all-important, especially in the young. Mimicry is strong in the child's nature, and bad habits are quickly contracted. Should he be tainted with nervous weakness in addition, he is apt to tic on the slenderest pretext, in which case to encounter, or still more to be associated with, the subject of a tic would be the direst of misfortunes.

That such a contingency should arise is not essential. A novel gesture on the part of any one catches the child's attention, and he forthwith attempts its reproduction, finding therein a source of complacent satisfaction. On the morrow the movement is repeated, and again, till it oversteps the bounds of habit and enters the realm of tic.

Cruchet concedes this to be a possible though by no means invariable mode of tic production, for the reason that the unconscious, or, more correctly, subconscious—polygonal, if you will—nature of imitation is undeniable, indeed self-evident.

Without entering into too great detail, it may not be amiss to examine this contention.

[1] CONSTANT, *Mémoires*, vol. i. p. 340.

To imitate, in Littré's definition, is "to seek to reproduce what another is doing." How such an act is to be accomplished without the co-operation of the will we cannot conceive. Its duration being so brief, our recollection of the conscious stage may be very imperfect, but that is no ground for denying its reality. Involuntary execution of a gesture to-day does not exclude the possibility of its voluntary execution yesterday. If we find accurate reconstitution of the steps in our own habitual mental processes impracticable, *a fortiori* ought we to question the likelihood of our gaining full insight into the mechanism of the processes of others.

It is no doubt this perplexity which has induced Cruchet to regard the simple convulsive tic as the sole manifestation of the disease. On his own admission, nevertheless, this simple convulsive tic is of exceptional occurrence, apart from children, in whom mental trouble is conspicuous by its absence.

But the psychical disorders of infancy, however embryonic they be, are none the less real. Their insignificance may hinder their recognition, yet they are often the prelude to graver and more definite anomalies in later life. And if their detection demands painstaking study and repeated interrogation, fruitless results may very well mean that the investigation was not sufficiently thorough.

Moreover, the view that regards imitation as a prolific element in the genesis of tics has met with widespread acceptance.

The onset of the disease (says Guinon) is sometimes the consequence of the patient's partiality for mimicry. Contact with an affected person supplies the occasion. His first experience is a sort of constant preoccupation ; the other's grimace is ever before his eyes, inviting imitation ; at length he suddenly yields to the obsession, and his tic is in the making.

Reference has already been made to a case of Tissié's,[1] where an eight-year-old child acquired from its mother an ocular tic, which a second child imitated in its turn. The cure of the latter was followed with the cure of the two others, *by imitation.*

The word "echokinesia" was imagined by Charcot to specify the inclination some people show to copy what they see others doing. It has also received the names of "mimicism" and "imitation neurosis." To quote Guinon again:

> The movements most closely and most infallibly mimicked are facial. These the patient either is driven actually to reproduce, or feels impelled to reproduce, without allowing the impulse to pass into action. Simple and circumscribed gestures involving the limbs are similarly, if less frequently, the object of imitation. Such tricks as rubbing the nose or cheek or some other part, or stooping as if to pick up something on the ground, may be counterfeited in their entirety, though at other times the movement is only initiated.

Echokinesia may be considered a motor disturbance analogous and akin to tic, but distinguished by the fact that it occurs exclusively during the performance, and as the reproduction, of some movement executed by another. It is true, of course, a genuine tic may be a reminiscence of some gesticulation, but it is quite independent of time and place.

A similar difference exists between echolalia—the habit of repeating another's sounds or words at the moment of their ejaculation—and tics of phonation or of language; the latter are always ill-timed and inappropriate, though they may have had their origin in acts of imitation.

It has become classical to draw a comparison between these echokinesic phenomena and the observations of O'Brien apropos of *latah* among the Malays.

[1] TISSIÉ, "Tic oculaire et facial," *Journ. de méd. de Bordeaux*, July 9 and 16, 1899.

A sailor on board a boat will pick up a piece of wood and proceed to rock it as if it were a child, whereupon a *latah* standing alongside commences to rock the infant he holds in his arms. The sailor then throws the piece of wood on to the deck, and the *latah* promptly follows suit with the baby (Guinon).

This is echokinesia carried to an extreme, revealing a complete absence of inhibition from the higher psychical functions.

Prominent among influences calculated to facilitate the evolution of tics is the patient's environment, more particularly where children are concerned.

The parents are often disposed to be deplorably "fond." Their ignorance or their thoughtlessness permits the installation of obnoxious habits and fosters their growth into tics. Any endeavour after suppression usually serves to expose the inadequacy of the family authority to exercise control and compel obedience. For the watchful discipline that should curb all such childish tricks and caprices is unfortunately substituted a disastrous indulgence that only stimulates the development of these embryonic tics. It should not be forgotten, moreover, that the mental instability of the fathers is visited upon the children in the guise of a certain aptitude for psychical anomalies.

The accompanying case supplies conclusive evidence of the mischief wrought by weakminded parents, and of the calamitous results of hereditary predisposition and bad example combined.

S.'s mother is a lady of over fifty, who spends her leisure hours in writing novels, and who suffers from different varieties of phobia. In the first place, she has an absurd fear of cats and dogs. When she goes out, a maid follows at several yards' distance to prevent the approach of any dog from the rear ; and if she is driving, the same precautions are observed.

Her dread of chest complaints is equally extravagant. A cold is her bugbear, a draught her *bête noire*. In the intervals of her literary labour she occupies herself with seeing that all doors and windows are properly shut. The room temperature is maintained at 68° F. at least.

Since her husband's death her devotion to her son's education has been fatal to his best interests. Her unfailing solicitude for his health, her constant terror of accident and illness, have reduced volitional effort in him to a minimum, and under this régime of tyrannical affection he has been as delicately nurtured as a young girl. Even at the age of thirty he must be indoors at night by ten o'clock, and a few minutes' delay will bring his mother to a state bordering on frenzy, and end in the dispatch of some one to seek him; whence all sorts of domestic discussions, and quarrels, and "scenes," with tears and mutual recrimination.

Little wonder then, with such an example, that, in spite of his own robust health, S. evinces the same senseless fear of chills and colds and currents of air, and tries the doors and windows so incessantly and so violently withal that they have to be repaired almost every month. In his own room they have been doubled and padded. His anxiety to avoid catching cold actually leads him to weigh the samples of cloth submitted to him, to ensure that his next suit of clothes will be of the same weight as his last.

With all this excess of tenderness, S.'s mother does not always err on the side of leniency. On the contrary, punishment is apportioned for the most trivial fault, although it is only necessary on S.'s part to simulate illness for his mother at once to yield to his most ridiculous caprice.

S. suffers from a rotatory tic of the head, which he attributes to a blow on the neck once administered by his mother by way of chastisement; but it may very well be questioned whether the torticollis was not rather a clever imposition intended to soften the mother's heart and bring about her repudiation of corporal punishment.

The case of J. is no less instructive, since he came of a family of veritable syphilophobes whose extraordinary frailties and sentimentalities contributed not a little to the progress of his disease.

A glimpse into the domestic life of L. is equally illuminating.

L. is an only child, who from infancy has usurped her parents' attention. Their uneasiness lest her "nervous movements" should prove detrimental to her general health is the explanation of her highly irregular attendance at school and of repeated holidaying. She may not go out alone, as her "incantations" are liable to arrest her in the middle of the street; at the same time lack of control over her legs may endanger her safety, and erratic arm gestures render the aid of a stick or umbrella useless.

To add to her misfortunes, her head has now begun to rotate to the right. She used four times a day to cross the narrow and little frequented road that separated her father's house from her place of employment; but since her last accident she has remained strictly within doors, trifling away the time in a chair, and finding in the petty life of a side-street all that she wants to attract her gaze or arouse her interest.

In this microcosm her father has been reduced to the position of a slave. He anticipates her slightest want and indulges her most fanciful whim; his commiseration for her woes is only equalled by his unselfishness in foregoing his own pleasure and his ingenuity in vindicating her weaknesses. In short, his ready acceptance of his daughter's instability argues a lack of mental balance on his own part.

Brain fatigue is another element in the formation of tics whose influence ought not to be underestimated. In the case of young D., nineteen years old, a clucking tic supervened during the period of preparation for an examination, to disappear at its close.

No less fruitful are anguish, anxiety, worry, disappointment, as will freely be conceded. Any prolonged concentration of the attention on a particular act or a particular idea presupposes a concomitant weakening of inhibitory power over other acts and ideas, which then become corrupt and inopportune, are incapable of further repression, and blossom into tics.

Indolence, too—the mother of all the vices, according to the adage—favours the outbreak of tics, and accelerates their growth. The idle patient's thoughts are all for his tic; its perfecting taxes his inventiveness.

Mention may be made in passing of the effect of "professional movements" in predisposing to the subsequent apparition of a tic in the muscles concerned. We have already alluded to the relation between tics and certain cramps or occupation neuroses, and we shall refer to the topic again at a later stage.

It would appear that even the memory of a familiar gesture sometimes suffices to initiate the condition: witness Grasset's case of post-professional colporteur

tic, where the subject reproduced the movement of swinging a bag over his shoulder, a souvenir of his former avocation.[1]

A final example, none the less instructive though it occur in lay literature, may be cited from Alfred de Vigny[2]:

> With a child's delight the worthy battalion commander gravely made ready to speak. He readjusted his polished shako on his head, and gave that twitch of the shoulder appreciated only by such as have served in the infantry—that twitch which is meant to raise the knapsack and momentarily to lighten its load ; it is a trick of the soldier's which with his elevation to officer's rank becomes a tic. Another sip of wine followed this convulsive gesture, a kick of encouragement in the little donkey's stomach, and he began. . . .

The description could not have been more accurate. The passage from the voluntary to the involuntary—the kick too may have been a tic—and the obvious infantile traits in the old gentleman's character, make the picture remarkably complete.

Apart, however, from the causes we have just enumerated, and others to be noticed below, we must emphasise the fact once again that mental predisposition is a *sine qua non* for the development of tic.

[1] GRASSET, "Tic du colporteur; spasme polygonal post-professionnel," *Nouv. icon. de la Salpêtrière*, July—August, 1897, p. 217.

[2] ALFRED DE VIGNY, *Servitude militaire*, chap. vi.

## CHAPTER VI

### PATHOLOGICAL ANATOMY

OUR ignorance of the pathological anatomy of tic is profound. Hitherto all the cases labelled tic in which a post-mortem examination has been made have in reality been spasmodic affections differing essentially from the tics as we understand them, according to the ideas of Trousseau, Charcot, and Brissaud. As far as we are aware, not a single sectio of a genuine case of tic is on record where a lesion, of whatever nature or whatever site it be, has been discovered to which the tic might be attributed. Either an autopsy is not obtained, or if it is, no special abnormality is remarked, or else the diagnosis has been erroneous and the changes described have not been those of tic.

It would be premature, of course, to conclude that tic is a disease *sine materia*. The affirmation is quite unwarranted. As is the case with numbers of neuroses and psychoses, we must for the present rest satisfied to observe symptoms; the mystery of their morbid anatomy will remain unsolved until our methods of investigation attain perfection. Magnan[1] says of "superior degenerates" that clinical observation reveals functional disorders so distinct and so invariable that it is impossible they should not be the outcome of some pathological modification of the organism. It is true he declares in another place[2] that the mentally unstable

[1] MAGNAN, *loc. cit.* p. 144.
[2] *Id.*, *loc. cit.* p. 145.

have all a family likeness, consisting not in identity of well-defined anatomical lesions, but in similarity of functional derangements. As it is, from the motor point of view tic is a functional act, and the governing centre is a functional centre that has become hypertrophied, so to speak, by being educated to excess. This physiological centre must not be confused with the "centre" of current anatomical terminology; it does not exercise an exclusive control over a particular territory—several such may co-exist in a single anatomical area.

Our lack of knowledge concerning the precise localisation of these functional centres is paralleled by our ignorance as to the manner of their involvement.

Noir has prudently observed that the manifestation of co-ordinated tics in cases of widespread cerebral disease, and the frequent occurrence of the most extensive and complex varieties in patients who have suffered from meningeal affections, suggest their cerebral origin. On these points, however, anatomo-pathological information is to seek, and for that matter the direct dependence of such an habitual movement as a co-ordinated tic upon one lesion is scarcely within the bounds of probability. Tic pertains to a psychical rather than to a motor sphere, and is to be regarded as a disease of the will.

With this statement, and with the expression of our hope that subsequent work will aid in the elucidation of the question, we shall close the chapter of the tic's pathological anatomy. It may not prove superfluous, however, to indicate why and how the facts gleaned from pathology and supposed to be in harmony with the clinical picture of tic should be allocated to other morbid entities.

In several cases considered to be tics of the face, cortical lesions have been discovered at the posterior end of the second frontal convolution, in the centre for

voluntary and co-ordinated movements of the contralateral facial muscles. It has become classical to cite an example described as long ago as 1864 by Debrou [1] under the title "painless facial tic," but a glance at the observation suffices at once to negative its classification as a tic, and to justify the diagnosis of a spasm of a quite peculiar sort.

On February 26, 1862, a porter, aged forty-nine, was suddenly seized with an "attack of the nerves," and at its close lost his speech. When examined at the hospital two days later, he was found to have full use of his limbs, understood perfectly all that was said to him, and evinced great impatience at being unable to respond except in writing or by gesture. He made signs to indicate that his head was paining him, and that he had difficulty in swallowing. In addition, abrupt, forcible, and rapid movements of the facial muscles on the right side were taking place; the angle of the mouth and the outer angle of the palpebral aperture were being dragged on; the external ear was elevated, or moving to and fro; the platysma was twitching visibly and the hyoid bone so acted on as to pull up the larynx spasmodically. The exhibition was an exact replica of the effect produced in animals by intracranial galvanisation of the facial nerve. Moments of absolute repose alternated with periods of spasm of a few seconds' duration, which addressing or handling the patient seemed to aggravate. There was synchronous spasm in the masseter muscles, resulting in elevation of the inferior maxilla. No other region of the body was affected.

On the night of March 2 the attacks of spasm and of pain increased in intensity and frequency, without any other change in their nature. The patient's mind remained unclouded, and as he was still deprived of the faculty of speech, he again indicated in writing the severity of his sufferings. About eleven o'clock at night the situation became more distressing; he began to be profoundly agitated, then passed into a more or less maniacal state, in which his limbs were involved in powerful muscular spasms, his eyes rolled in their sockets, and his respiration commenced to be stertorous, while the violence of his struggles necessitated the intervention of two assistants to control him. An hour or two later, during one of these attacks the end came.

At the autopsy, under the arachnoid and spreading over the left hemisphere at the junction of its anterior and middle thirds, was a large blood-clot, dark, coagulated, and free in the cerebral substance, which

[1] DEBROU, "Sur le tic non douloureux de la face," *Arch. gén. de méd.*, June, 1864, p. 641.

it had penetrated for a depth of about one centimetre. It appeared to be of about four or six days' formation, and probably dated from the incipient "attack of the nerves." Painstaking scrutiny of the cerebellum and cranial nerves failed to reveal any further pathological condition.

To tell the truth, we are not averse to wagering that to-day the opinion of the surgeon would be invited on a similar case, where the motor reactions of the so-called tic are manifestly based on a Jacksonian type.

In a case recorded by Chipault and A. Chipault,[1] and characterised by brief epileptiform attacks involving the left side of the face, cerebral exploration proved ineffectual, but at the postmortem a subcortical glioma of the size of a cherry was discovered underneath the posterior end of the second frontal convolution. Is a case of cerebral tumour to be labelled *tic*?

It is quite exceptional, in fact, for lesions of the cortical facial centres to give rise to muscular movements suggesting facial tic. Take another instance:

An interesting case (says Brissaud), and one that is everywhere quoted, is reported by Schultz, in which an aneurism of the vertebral artery, at the point where the basilar arises, compressed the trunk of the left facial nerve, and occasioned a "tic" of ten years' duration. As a matter of fact, one could not have a better example of *spasm* pure and simple.

Féré[2] cites the following incident in support of the contention that encephalic trauma may engender a tic:

A man in falling on his head sustained an injury to the cranial vault over the posterior section of the left parietal bone, at a spot exactly corresponding to the posterior part of the angular gyrus, and immediately became afflicted with a convulsive tic of the zygomatics and orbicularis palpebrarum on the right. Conformably to Ferrier's experimental localisation of the motor centre for the eye muscles and

[1] CHIPAULT AND A. CHIPAULT, *Rev. neurologique*, 1893, p. 149.
[2] FÉRÉ, *Arch. de physiol.*, 1876, p. 267.

lids in the angular gyrus, irritation of this centre by the cranial injury was the diagnosis made.

The proffered interpretation of the motor phenomena by cortical excitation is entirely justifiable, but no convulsion consecutive to traumatism can ever pass muster as a tic.

A no less frequently quoted experiment of Gilbert, Cadiot, and Roger,[1] supposed to confirm certain results obtained by Nothnagel, is now a standard case in the history of tic hypotheses. The animal in question was a dog affected with spasmodic twitches of the ear, which the successive removal of cortical facial centre, internal capsule, corpora striata, and cerebellum, signally failed to alleviate, and which disappeared only with the destruction of the corresponding nucleus in the pons. Their inability to find any anatomical change determined the experimenters in favour of the view that the trouble was functional, and they described it as a tic.

It would be foolhardy to deny the existence of a lesion on the ground that it was not discovered. Negative findings of this sort are valueless. The sole conclusion to draw from the incident is the all-important rôle played by the bulbar centres in the production of convulsive movements, which are in such circumstances, of course, nought else than spasms.

Compression of cranial nerves by tumours or aneurisms of the base has been the cause of symptoms imagined to be identical with those of tic. The case of intracranial neoplasm mentioned by Oppenheim, in which irritation of the upper branch of the trigeminal was accompanied by homolateral facial contraction, is wholly comparable to the so-called "tic douloureux."

No less positive is our refusal to accept as tics

[1] GILBERT, CADIOT, AND ROGER, "Note sur l'origine bulbaire du tic de la face," *Rev. de méd.*, 1890, p. 431.

spasmodic contractions in association with or subsequent to facial palsy or contracture of peripheral or central origin. They are spasms, not tics. Cruchet, for instance, describes indifferently as labial tic or intermittent labial hemispasm clonic elevation or depression of the oral aperture developing in central facial paralysis, especially in children. As example he refers to the case of a child in whom an ictus at the age of three years was followed by a typical spastic hemiplegia on the left side, with athetoido-choreic movements chiefly in the arm.

At first the left side of the face was flaccid and deviated in the other direction, but at the time of examination it presented no unusual feature beyond a continual twitching, a real convulsive tic, of the upper lip.

Now, whatever a facial convulsion of apoplectic origin, secondary to facial palsy and accompanied with spastic hemiplegia and athetosis, may be, it is at all events no tic.

Take one more case, given by Buss[1] as "convulsive tic of the left side of the face."

The patient was an atheromatous subject, with cardiac hypertrophy, bronchitis, and emphysema. When he first came under observation at the hospital, his eyelids, cheek, and buccal commissure were the seat of painless clonic contractions, which a month later were complicated by giddiness, vomiting, inability to stand or walk, lancinating pain over the right side of the face, weakness of the right limbs, and left facial paresis, and had become fugitive and insignificant. Loss of consciousness was followed by flaccidity of all four extremities, hyperpyrexia, and death. The sectio showed a hæmorrhage of the dimensions of a pigeon's egg which had destroyed the left half of the pons, and an atheromatous dilatation of the left posterior cerebellar artery, impinging at one spot on the seventh and eighth nerves of the same side. Microscopical examination of their trunks and of the facial area in the pons disclosed no abnormality.

The pathological anatomy of this case indicates its nature unmistakably, and its symptomatology and evo-

[1] Buss, quoted by Cruchet, *Thèse de Paris*, p. 19.

lution, moreover, do not bear the remotest resemblance to those of tic.

In the opinion of Debrou,[1] convulsive tic is a functional derangement of a motor nerve, analogous to the neuralgia of a sensory one. To strengthen his argument he relied on such cases as those of Romberg, Schultz, Rosenthal, Oppolzer, where disease of neighbouring structures (enlarged glands, otitis media, caries of the temporal bone, etc.) was the agent in the production of muscular twitches in the domain of the facial. In our view, however, they are simply spasms provoked by irritation on the centrifugal path of a reflex bulbar arc.

The slight contractions occasionally seen both on the paralysed and on the non-paralysed side in the secondary contracture stage of facial palsy—a condition noted by Duchenne of Boulogne, Hitzig, and others, and distinct from fibrillary twitching—are nothing more than spasms, and the same obtains where the palsy is consecutive to affections of the ear.

Chipault and le Fur recently[2] communicated to the Academy of Medicine a case of intermittent attacks of acute pain in the right hypochondriac region, associated with violent contractions of the muscles of the right abdominal wall, which they described as a tic comparable to tic douloureux of the face. It was seen at the subsequent operation that the eighth, ninth, and tenth posterior spinal roots on the right side were surrounded in their passage through the meninges by a patch of matted and cicatricial arachnoiditis, dissection of which was instrumental in effecting immediate relief.

[1] DEBROU, *loc. cit.* p. 641.

[2] CHIPAULT AND LE FUR, "Névralgie des huitième, neuvième, et dixième racines dorsales avec tic abdominal," *Gaz. des hôpitaux*, March 20, 1902, p. 325.

One could not desire a more typical example of reflex spasm, the area of irritation in this case being situated at a point on the centripetal arc close to the medullary centre.

We may be allowed to quote a last case from Cruchet:

A little phthisical girl, four and a half years old, began to complain of headache, and in the course of the next day became delirious. Three days later the delirium gave place to generalised convulsive seizures affecting chiefly the arms, and more pronounced on the left side. Simultaneously a tic of the right side of the face was observed, distinguished by raising of the upper lip and closure of the palpebral aperture. Sleep brought no modification in its train. Up to this stage a very feeble degree of contracture of the jaw muscles had been noted, but this speedily became accentuated to such an extent that nasal feeding had to be adopted. Some hours previous to the child's death the tic disappeared, only occasional slight convulsive twitches of the right arm remaining. Consciousness was maintained to the last minute.

At the autopsy the characteristic appearances of tuberculous meningitis were found: the base of the brain at the anterior perforated spot and origin of the sylvian artery was covered with gelatinous purulent patches, the colour of prune juice, which extended backwards to the pons; one in particular had enveloped the basilar trunk and sent out a prolongation on the right side, which surrounded the sixth, seventh, and eighth nerves at their point of emergence.

For our part, we cannot apply the word tic to the convulsive phenomena of tuberculous meningitis. If localised spasms occurring in the course of a grave illness, associated with fever, headache, and delirium, with contractures and generalised convulsions, and if the spasmodic manifestations of rapidly fatal pyrexias, are all to be denominated tics, then the term has no longer any significance, and it would be wiser to give it at once its quietus.

We are well enough aware that Cruchet believes there is a "convulsive tic symptom"; in other words, certain symptoms in such and such a disease appear in the guise of convulsive tic, "a movement or combination of movements representing in a clonic fashion a physio-

logical act." Nevertheless, we are not convinced that the convulsive movements of Cruchet's patients exhibit the sequence of "regulated physiological acts."

He further draws an analogy between the foregoing case and the partial convulsions of toxæmias, cerebral tumours, etc., "transient convulsions supervening in the course of acute or chronic affections, and readily recognisable." In exceptional circumstances they may "assume the form of convulsive tic." In strict truth the *form* may be the same, but examination of the patient will soon demonstrate that the two are alike merely in appearance, and compel the reconsideration of an immature diagnosis.

Our position is that tic is more than a symptom—it is a symptom-complex. Cruchet's definition of convulsive tic just quoted is by itself insufficient; the additional and indispensable factor is the characteristic mental defect, of which so illuminating an exposition was given by Charcot.

Finally, the knowledge derived from the pathological investigation of myoclonus and polyclonus does not of necessity throw light on the morbid anatomy of tic.

In the case of an epileptic who suffered from myoclonus in his last years, ischæmic degenerations were found by Rossi and Gonzales disseminated throughout the brain, especially in the rolandic area, but any inference to hold good for the tics would be premature.

The term polyclonus has been employed by Murri to designate a succession of clonic contractions of the limbs, due to the existence of punctiform hæmorrhages or areas of softening scattered throughout the rolandic cortex. The character of the motor reaction in these cases, however, bears no resemblance either to tic or to chorea, although the fact of the relation between diffuse cortical lesions and convulsive move-

ments is calculated to enhance the difficulties of diagnosis.

Vincenzo Patella[1] has recently called attention to a case of polyclonus in which the disappearance of the symptoms during sleep suggested their purely functional origin, but histological examination of the rolandic grey matter at a subsequent period revealed the presence of numerous foci of degeneration. We are as yet, however, far from grasping the real meaning of such symptoms, which, moreover, from the clinical standpoint, cannot always be assimilated to those of the tics. Conclusive anatomical information is therefore still being awaited.

The functional nature of the movements we have had under discussion is unfortunately an obstacle in the way of our early knowledge of their pathology. As long as we remain ignorant of the actual cause of the neuroses and psychoses, so long will the pathological anatomy of tic continue a sealed book. All that has been written on this topic hitherto really concerns spasm and other convulsive affections secondary to irritation of nerve centres or conductors. If we may venture to express an opinion, it is that we should not be surprised if post-mortem examination rest constantly negative. As a matter of fact, we do not favour the view that the phenomena depend on an acquired lesion; rather are we inclined to believe that they represent some congenital anomaly, some arrest or defect in the development of cortical association paths or subcortical anastomoses, minute teratological malformations that our medical knowledge is still unhappily powerless to appreciate.

[1] PATELLA, "Studio anatomo-patologico e clinico sul policlono," *Il policlinico*, vol. viii. November, 1901, p. 535.

## CHAPTER VII

### STUDY OF THE MOTOR REACTION

THE general characters of the motor reaction constituting the objective manifestation of tic form the subject of previous analysis in the chapter on pathological physiology. It is our present intention to approach them from the semiological point of view.

To give a description of the motor disturbance of universal applicability is evidently to attempt the impossible. The modifications of functional acts are legion, and in the case of tic anomalies of muscular contraction vary not merely with the individual, but in the individual. Each tics after his own fashion; and no two tics are ever exactly interchangeable. As Trousseau was wont to say, "the disease in a sense forms part of the constitution of the person affected."

### THE TYPE OF MOTOR REACTION—CLONIC TIC AND TONIC TIC

The motor reaction may be either *clonic* or *tonic* in type. Clonic tics are distinguished by more or less abrupt contractions, separated by longer or shorter intervals of relaxation or repose. The duration of a clonic tic convulsion may be exceedingly brief, though perhaps not so brief as the instantaneous "electric" twitches of a spasm, which have the extreme rapidity of pure reflex phenomena. Exception ought to be made for the face, no doubt, seeing that the suddenness

of the movements in facial tic is precisely what complicates the diagnosis between it and facial spasm, as we shall see. In the limbs, the variations appear to stand in close relation to the nature of the primary factor, the mental condition of the patient, and the mode of reaction peculiar to him. The quickness with which the reaction occurs increases in proportion to the length of time the tic has existed, although once it has become habitual, any further change is rather in the direction of additional complexity.

Sometimes a relative deliberateness of execution raises suspicions as to the accuracy of the diagnosis. In the case of a child with several tics, one affecting the mouth in particular, Guinon was struck by the slowness of the muscular contractions.

> To begin with (he says), the mouth was opened gradually, but as soon as the limit of separation of the maxillæ was reached, it was immediately closed, without remaining even for a moment in the extended position, as one would have expected had there been a tonic contraction of the infrahyoid muscles.

Cases of this kind, however, are not really instances of the tonic variety.

One of us has had the opportunity of observing a young woman afflicted with a curious combination of motor disorders, akin no less to the clonic form of tic than to the gesticulations of chorea and the undulatory movements of athetosis. Their resemblance to the clinical type described by Brissaud under the name of *variable chorea* is noteworthy, a distinguishing feature, however, being the sluggishness of the muscular contractions, which may well be a reflex of the patient's mental inertness.

> Mademoiselle R., a young woman twenty-six years old, is a small and delicate creature with slender limbs and tapering fingers. She is extremely myopic, but her general health is excellent, and there is

nothing to suggest that she is suffering from organic disease of the nervous system. Apart from the fact that her parents are rather "nervous," the family history is negative.

Since the age of twelve she has been subject to various tics of the face and head. She wrinkles her forehead and moves her scalp to and fro, and sometimes she turns her head slowly and steadily towards the left side, raising her eyes up and to the left at the same moment. Head and eyes forthwith resume their normal position. The deliberateness of the act is altogether exceptional. If, however, she happens to be wearing her hat—which is remarkable for its size, weight, and unwieldiness—the gesture is repeated in a quick and jerky manner. Any diversion, such as reading, knitting, listening to a conversation, especially if she feels she is not being noticed, will augment the intensity of the movements, which the thought of being observed, or the awakening of her interest, or rest in bed, or sleep, has the effect of abbreviating or checking.

Our earliest step was to confiscate the offending hat, and this had the instantaneous result of diminishing the violence and frequency of the tic, which the subsequent practice of appropriate exercises entirely dispelled.

If now we direct our attention to the psychical aspect of the case, we are struck with the goodness, devotion, and disinterestedness of our patient. Her one concern is for the welfare of others, and she is indifferent to the pleasures of literature, art, games, or even work. All that is required of her she performs with docility, but never with animation. The extent of her passiveness is seen in her childlike acceptance of her parents' wishes. Her temperament is neither gay nor sad, but merely dull. Indolence and maladroitness predominate in all her actions, and reveal themselves in the curious awkwardness and nonchalance that characterise the execution of even the simplest movement. She is essentially of a very unstable nature, but its torpidity is no less obvious than its instability. If there is no abruptness in her acts, it is equally true that she is never still. She cannot maintain any given attitude; she cannot fix her gaze on any particular object. Her restlessness is such that her position is changed from moment to moment, however slowly and imperceptibly. Her eyes are only half opened; as she speaks, her lips are scarcely seen to move.

It has been a laborious and protracted task to teach her to sit motionless with her hands in front of her, and no less unremitting effort has been required to make her open her mouth properly, or turn her head naturally from side to side.

In some ways the endless movements of her hands and fingers—she never ceases playing with her dress or her gloves or her handkerchief—are vaguely reminiscent of those of athetosis, and on the left side especially,

if they become a little brisker, there is slight hyperextension of the phalanges. She reads aloud in a low, colourless, monotonous tone of voice, without punctuation or accent, articulating the syllables defectively and slurring the ends of the words. At the finish of each paragraph comes a halt, as if from fatigue, and on command a fresh start is made with the same careless indifference. As for the lower extremities, the tale is identical. Mademoiselle R. cannot stand upright. She rests on either one leg or the other. Her left foot is never flat on the ground, but sometimes on the inner border, sometimes on the outer. The faulty attitude is readily enough corrected, though she declares she is ignorant of it. It is a sort of half clonic, half tonic, tic of the foot, whose slowness is on a par with that of all her other acts.

It is because clonic tics are so easily recognised that they are the most familiar, but we must not ignore another variety—viz. the *tonic tics*, corresponding to the tonic form of convulsion.

Tonic tic is of common occurrence in cases of mental torticollis. In that disease rotation of the head may be sustained for a considerable length of time without interruption, showing the permanent nature of the muscular contraction. Strictly speaking, we are concerned not with a sudden gesture, but with an attitude. Abundant evidence is forthcoming to substantiate its mental origin, and it may therefore be described as an attitude tic. Among other instances of tonic tics may be specified the affection of the masseters known as mental trismus (Raymond and Janet), or that continuous contraction of the orbicularis which keeps the eye half closed, though it may momentarily disappear under the influence of the will—a tonic blinking tic. O. and young J. have already supplied examples of attitude tics, and reference may further be made to another of our patients[1]:

Sometimes the mouth is drawn directly and completely to the left, more usually to the right; at other times simultaneous contraction of

[1] FEINDEL, "Spasmes grimaçants de la face," *Revue de psychologie*, April, 1899, p. 118.

the upper and lower lips takes place, constituting a sufficiently faithful reproduction of the grimace made by a child in the attempt to refrain from crying ; at other times still, imperfect closure of the lids and upward deviation of the eyes bear a resemblance to children's imitation of a blind man. Displacement of the mouth to the right is the movement of longest duration, and while it persists the patient is capable of stuttering speech, without relaxing her lips. The other tics last but a few seconds, while all vanish if she laughs or opens her mouth wide to exhibit her tongue. They follow each other at irregular intervals, and during the moments of rest the face resumes its normal expression.

Cruchet, as has been already remarked, has criticised the use of the term attitude tic, on the ground that the adoption of an attitude, however vicious it be, need not be the outcome of a convulsion. Doubtless; but it is no less true that a tonic convulsion may "take shape"—*e.g.* the *arc de cercle* of hysteria, the phenomena of catatonia and catalepsy, etc. Of course if the word tic is to be synonymous with *intermittent* twitching, then it is inapplicable in this class of case; but if our connotation of the term be accepted, we must find an expression that will serve to differentiate between tonic and clonic varieties. We are not aware of any particular advantage in describing the condition as a permanent contraction, for the obvious result of a permanent contraction, whether it be clenching of the jaws, occlusion of the eyelids, or rotation of the head, is the production of an attitude, a "position in which the body is kept" (Littré). No other designation could therefore be more appropriate than attitude tic, or could indeed be imagined, seeing that Cruchet himself ranges mental torticollis among the tics, and describes it as "an attitude of defence and of repose."

It may sometimes happen that the manifestations of stereotyped acts consist in the assumption of attitudes, but in spite of their affinity to the tics we deem it preferable to reserve the term "stereotyped attitude" or "akinetic stereotyped act" for cases where the

motor reaction is clothed in the form of a normal movement. As it is inaccurate to describe as a tic a repeated gesture whose execution is normal in degree and in rapidity, so the mere immobility of a limb, or the prolonged contraction of a muscle, ought not to be called an attitude tic if the muscular effort does not differ from that which a healthy person would make to preserve the same position. In such circumstances we say that it is a stereotyped gesture or attitude. For the diagnosis of tic it is insufficient to establish the existence of a transient or permanent muscular contraction, and to note the inopportuneness of the movement; the contraction must be abnormal in itself, its abruptness unwonted and its intensity excessive—in short, it must be a convulsion; and finally, its repetition must be continued and exaggerated.

We have felt that some such explanation as the foregoing is required to justify our use of the term tonic or attitude tic, to whose close intimacy and association with the better-known type pathogeny and clinical observation alike bear witness. In any case such terms as myotonus or myoclonus are too comprehensive, in view of our present-day knowledge, to specify the particular motor affection with which we are concerned.

As a general rule it is only one part or segment of the body that is immobilised by a tonic tic, but in regard to the possibility of a general involvement, the following instance[1] may be cited, although we do not think it can be considered decisive:

A man thirty-two years old, who had recovered from a first attack of mental torticollis, underwent a relapse in quite a different form. If

[1] BRISSAUD AND FEINDEL, "Sur le traitement du torticolis mental et des tics singulaires," *Journ. de neurologie*, April 15, 1899.

when walking with his head perfectly straight he were asked to go round to the right, he instantly appeared to become rooted to the spot and could not turn even his head in the required direction ; at the same time he felt a compression of his throat as if he were being strangled, and for a few seconds he experienced acute anguish. A moment later he was all right again, and his action unimpeded.

Without going so far as to classify this incident as a tic, and without venturing to assert the existence of a *tic of immobility*, one cannot but be struck with its analogy to the attitude tics of which we have been speaking, and to catatonic conditions met with in the insane, of which too the pathogeny presents more than one point of similarity with that of this species of tic.

[In this connection reference may be made to certain conditions occasionally noted among those who tic—viz. a curious tendency to maintain abnormal positions of the limbs or trunks, and difficulty in or impossibility of relaxing various muscles (*catatonic aptitudes*). Patients are sometimes given to the exaggerated repetition of the ordinary movements of their members (*echokinesis*), as well as to imitation of the actions of others (*echomimia*). Such catatonic and echopraxic phenomena[1] are not confined to sufferers from tic, for they are encountered among psychopathic subjects generally, and indicate defect of cortical control—what is called by Brissaud "passive activity." These catatonic aptitudes may be discovered by resort to clinical tests, such as letting the arm fall from the horizontal position.[2]]

### INTENSITY OF THE MOTOR REACTION

The muscular contraction varies considerably in intensity, in most cases exceeding that of the cor-

[1] MEIGE, "L'aptitude catatonique et l'aptitude echopraxique des tiqueurs," *Congrès de Madrid*, April, 1903.

[2] MEIGE, "Le phénomène de la chute du bras," *XIII Congrès des neurologistes*, etc., Brussels, 1903.

responding normal movement, and, especially in tonic tics, being often so powerful as to necessitate the exertion of great force to overcome it. Even though one's effort prove unavailing, however, it is only needful to distract the patient's attention to perform any and every passive movement with consummate ease.

In the case of S., any attempt to budge the head from its torticollic position on the left evokes strong muscular resistance; but engage him in conversation or otherwise divert his mind, and the difficulty soon vanishes. By similar means, the resistance awakened by sudden change of the direction of passive rotation will rapidly die down.

Occasionally the muscles brought into play surpass their fellows of the opposite side in size and power, this secondary hypertrophy being the natural sequel of repeated exercise. It was noted by Charcot that in rotatory tics the disused muscles atrophied, whereas the affected muscles hypertrophied, but they may do so only in appearance. The tonus of the muscles at the moment of examination may create differences inappreciable during relaxation. Sometimes one comes across such expressions as "paresis" or even "paralysis" of antagonistic muscles, and "contracture" of those in which the tic is localised. To draw a distinction between slight contracture of the latter and mild paresis of the former is a problem practically always insoluble. Opinion has been ever divided on this point; yet some, in their desire to harmonise the two, take up an eclectic position and do not hesitate to speak[1] of "paralytic contracture," or "mixed contracture, at once active and passive," a terminology by no means calculated to simplify the question, and one the discussion of which we do not care to pursue.

[1] SCHEIBER, "Über einen Fall von durch Spleniuskrampf bedingten Torticollis," *Wiener med. Wochenschrift*, 1900, p. 261.

We should like, however, to allude to a matter of clinical observation that we frequently have had occasion to remark. What simulates muscular enfeeblement in the subject of tic is often nothing else than a want of accuracy and *adresse* in the performance of a given movement. For instance:

S. enjoys robust health; his only trouble is a lack of accurate control over his limbs. His execution of the most elementary movements is incorrect. There is no tremor, no jerkiness, simply a loss of the sense of position. He never knows whether he is holding himself straight, whether his arms are exactly horizontal or his shoulders symmetrical. Often he confuses right and left, and when requested to perform some act on one side, he declares he is tempted to perform it simultaneously on both. The order to fold his arms and rotate the upper part of his body to the right evokes an inconceivable display of contortions. In the attempt to bend his head and body backward, fear of losing his balance causes him to twist and turn about most strangely, and the remark that all this he might avoid by merely putting one foot further back seems to cause him infinite surprise.

Or again:

The absence of precision in Mademoiselle R.'s movements, her habit of arresting the action before attaining the desired end, are not to be ascribed to any feeling of discomfort, but to her ignorance of the amplitude of her efforts, and of the position of her limbs. Her acts are always feeble, hesitating, and curtailed, a curious mixture of muscular languor and vigilance, "as if she were afraid of breaking herself." She appears to be constantly seeking some new position for herself, and to be as constantly oblivious of her actual attitude. With eyes closed, however, she indicates the relation of her limbs exactly.

Another example is furnished by the case of L., to which reference is made on p. 135.

There is no call to multiply instances. Enough has been said to demonstrate the frequent occurrence, if not of motor inco-ordination, at least of faulty orientation in space and of defective estimation in regard to the range and intensity of voluntary movements, among the subjects of tic. The topic is a very interesting and

fruitful one, on which considerable light may be thrown by the application to it of the results of Pierre Bonnier's[1] remarkable studies on the sense of attitudes, a subject that we intend to develop on another occasion.

### FREQUENCY AND RHYTHM—RHYTHMIC TIC

The frequency of the muscular contractions in tic is so very variable that it cannot be regarded as a distinctive feature, nor is there any evidence to show that it is rhythmical, as some would have us believe. Contrary to what obtains in tremor, there is no periodicity in the motor phenomena, even when the tic is based on derangement of a function whose manifestations are rhythmical, such as the function of respiration. Conditions described as rhythmic tics, or less well as rhythmic spasms, seem to form a group by themselves; probably they do not belong to the same family as the tics, indeed in some cases they are symptomatic of encephalic lesions, as in the *spasmus nutans* of infants, or the rhythmic tics of idiots and imbeciles. In this connection the remarks of Noir are very pertinent:

> We shall be well advised to refrain from drawing too absolute conclusions in questions so difficult, where even the framing of an hypothesis demands prolonged observation, but we cannot withstand the temptation to note the co-existence of certain of these tics with certain definite lesions recognisable post-mortem. This has been done before us by our master Bourneville, who has on several occasions made the diagnosis of chronic meningo-encephalitis, cerebral sclerosis, etc., from this association of rocking, rotation, and krouomanic movements with a special symptom-complex, and verified it at the autopsy. Nevertheless, there is not always an absolute correspondence between them, wherefore Bourneville, with an altogether praiseworthy scientific reserve, has hesitated to consider these tics as actual symptoms of the affections alluded to, and we shall follow his prudent example.

[1] BONNIER, *L'orientation*, Paris, 1900; *Le sens des attitudes*, Paris 1904.

To the combination of various rhythmical acts with hysteria we shall revert at a later stage. Under the title "rhythmic spasm" an interesting case has been reported at length by de Buck,[1] concerning a young woman, free of hysterical stigmata, in whom convulsive movements first appeared at the age of seven years.

When she had attained her nineteenth year she commenced to suffer from attacks of anguish of some hours' duration, but disappearing under the influence of sleep, in which she felt as though her breathing were going to stop and she herself were about to die. On the termination of these sensations some eighteen months later, their place was taken by convulsive movements of the tongue, lips, neck, trunk, left arm, diaphragm, pharynx, and muscles of respiration. These consisted of clonic rhythmical twitches, each preceded by an inspiration and succeeded by an expiratory ejaculation, repeated fifty or sixty times a minute. During the seizure the tongue was protruded and deviated to the left, the left arm was raised, the head and trunk bent down and forward. All day long the movements were continued with unflagging regularity. Rest in bed was without effect, but they were dispelled by sleep. Distraction and occupation exercised an inhibitory influence on them, whereas voluntary control was both feeble and fleeting. In the condition of the patient there was nothing else abnormal with the exception of slow, monotonous, and syllabic speech. Her mental development was perhaps a little immature, but signs of hysteria were lacking, and all attempts at treatment by suggestion and hypnotism failed of their object. Death ensued from pulmonary tuberculosis.

De Buck observes that while the action of some of the muscular groups involved in the rhythmic spasm was, so to speak, purposive, the whole did not constitute any known, conscious, and logical movement. It may have been a species of tic, but the rhythmical sequence of the convulsions imparts to it a quite peculiar character.

### ATTACKS

A further mark of the motor reaction is the circumstance that it ceases for a longer or shorter interval,

[1] De Buck, "Note sur un cas de spasme rythmique," *Belgique médicale*, 1899.

independently of the tic's localisation, intensity, or form, the result being an alternating series of "attacks" and periods of respite. In different patients, and in the same patient, the number and the length of these attacks are as variable as are the spaces of rest that separate them. We remember a girl with a tic consisting in a toss of the head repeated perhaps fifteen times a minute, three or four occurring together at intervals of one or two seconds, and being succeeded by a relatively long pause. The effect of treatment was to modify the sequence entirely, and to reduce the tic to an isolated jerk reappearing not oftener than once in a quarter of an hour, and in itself constituting the attack. In another case the patient's head used to turn to the left, remain so for a moment, then resume its ordinary place. After a time of repose the tic began again, and even when the movements followed each other more rapidly, the intervening period was always appreciable. On the other hand, we have seen a youth afflicted with multiple tics which continued without intermission the whole day long; the attack lasted, strictly speaking, from morning to night, and any break in its continuity was altogether exceptional. It might then be more exact, perhaps, to use the epithet paroxysmal in reference to the external manifestations of tics, but it signifies little what word we employ provided we are familiar with the clinical facts.

The attacks vary with circumstances and environment. One of our patients remained quite free from them during a visit to the theatre. Tissié had a young patient who did not tic at all while on holiday, but the reopening of his classes was the signal for a fresh outbreak. Similarly, no rule whatever seems to govern the duration of the times of relief; they may never be longer than a few seconds, or they may run into months. In the face of these data we cannot supply further

generalisations; it will be sufficient if we impress on ourselves the importance of one fundamental element in the constitution of tic—viz. its repetition.

## LOCALISATION OF THE MOTOR REACTION—VARIABLE TICS—FIXED TICS

The localisation of the motor reaction in cases of tic is essentially physiological. In rare instances its sphere may be limited to a single muscle, if one muscle only be requisitioned for the performance of a functional act; but it is very much more usual to find several muscles contributing, whose synergic contractions fashion the movement of which the tic is a caricature. If the same effect is yielded by the action of either of two different muscles or groups of muscles, as in rotation of the head, and if one be hindered from fulfilling its function, the incidence of a tic originally located in it will promptly be transferred to the other. This is the explanation of the persistence of rotatory tics after exclusion of the sternomastoids by surgical means.

Two symmetrical muscles may be affected, as in tics of blinking and of affirmation, or a median muscle, such as the orbicularis oris. Much more frequently the tic is unilateral in its distribution, as, for instance, when it involves the face; in this respect its figuration as a functional disturbance is well exemplified, for expressional movements of the face are normally bilateral. A tic may settle itself on two mutually antagonistic muscles, and manifest its presence in the immobilisation of a limb or segment of a limb; or only a portion of a muscle may contract, as in the case of the deltoid or trapezius, which are composed of bundles anatomically associated but physiologically independent, and so capable of being functionally differentiated by volun-

tary education. Fibrillary contraction and tic have nothing in common.

Inasmuch as the muscles concerned are under voluntary control, and their contractions such as the will can effect, it follows that with adequate practice the movement of a tic can always be imitated, and in predisposed soil imitation tics may thus take root; it is not always feasible, on the other hand, to counterfeit a spasm.

Several functional muscular territories may be simultaneously affected, and several tics may follow one another in quick succession, the duration of any one tic on any one site being a more or less varying quantity.

We have already noted the occurrence of variable tics. They appear one day to disappear a few days later, and reappear again after another space. Weeks or months may elapse without any vestige of them, until they suddenly break forth again unheralded. As a general though not absolute rule, the younger the patient, the less stable his tics. Occasionally they are isolated, limited, and stationary, one of the most frequent of this kind being a tic of blinking, but the intimate alliance between the motor troubles and the mental level of the subject helps to explain why these tics of children are so changeable.

In the case of young J., for instance, it was shortly after attaining his tenth year and entering school that first he began to tic, and thenceforward, at unequal intervals, trunk, arms, shoulders, legs, became in turn the seat of "movements of the nerves," while other more definite tics were not slow in developing.

When only six years old B. exhibited a respiratory tic, which changed a year later to one of the tongue, and after another year to one of the leg; at the age of twelve he used to nod his head in affirmation, and this was eventually succeeded by movements of negation, etc. He has since started a salaam tic, and finally a torticollis with deviation of the eyes.

We may cite an analogous case from Grasset:

A young girl, who had had eye and mouth tics in childhood, commenced at the age of fifteen to advance her right leg involuntarily—a sort of tic which lasted several months and gave place to paralysis of the same limb; for this affection was next substituted a whistling tic, and then for a whole year she used from time to time to give vent to a loud "Ah!" When she came under observation she was suffering from a tic of salutation, with retrocollic jerking of the head and shrugging of the right shoulder.

One of our own patients furnished us with the following story:

The disease made its debut by a blinking tic of both eyes, whose origin in the absence of any visual defect remained undetermined; grimacing and distortion of the mouth were the next to appear, as well as wrinkling of the nose and forehead, twitching of the eyebrows and contraction of one platysma, sometimes even of the ear muscles and the entire scalp. Then ensued up-and-down tossing of the head, or rotation of it from right to left, and, later, elevation and advancement of the shoulders, with restless agitation of hands and arms. A former trick of his of biting his nails is quite in abeyance at present; instead, he catches hold of his under lip every moment and abrades its mucous membrane with his nails, so much so that the lip is swollen and cracked like those of children with nibbling tics. Some months ago he acquired the habit of giving utterance to a soft little cry not unlike the sound made by a guinea-pig.

One tic has succeeded another in an unbroken series. The facial tics were more of the nature of grimaces, which the child amused itself in repeating; no doubt the scratching of the lip was a sequel to the desire of experiencing a new sensation, while the movements of hands, arms, and shoulders were very variable and different enough from the accompanying phenomena. No one of the tics was at all of protracted duration; on the contrary, each was fugitive and changeable, and therein presented a resemblance to the child's mental status. In sleep they completely disappeared; in the presence of strangers or if his interest was in any way aroused, they quieted down, while they increased on holidays, during games, or with physical fatigue.

It is clear that determination of the tic's localisation and mode can come only with the mental evolution of the patient, and that the transformation from the psychical

inconsistency of childhood to the stability of the adult is paralleled by the change in the tic's manifestations as the scale of age is ascended. Any individual, whatever his years, who is in the stage of mental infantilism, will tic after the manner of a child, for the characters of a tic are dependent on the state of mind of its subject.

## CHAPTER VIII

### ACCESSORY SYMPTOMS

### REFLEXES

THE question whether in cases of tic there is any alteration in superficial or deep reflexes can be decisively answered only by an appeal to statistics, the information afforded by which has hitherto been too scanty and too incomplete. Judging from our own observations in about thirty cases, we feel compelled to admit that disorders of this kind are altogether exceptional. Careful and repeated examination has convinced us that in patients suffering from tic the knee, ankle, wrist, elbow, and other jerks, the plantar and fascia lata reflexes, as well as those of the pharynx, eyes, etc., are all but universally normal, and any trifling exaggeration or diminution not only varies from day to day, but also in no wise exceeds the differences met with in health, and is therefore symptomatologically negligible. In the manifold varieties of tic represented by R., S., P., N., M., B., etc., whose cases are quoted here in part, our inquiries have always been negative. Noir's research on the state of the reflexes in idiocy complicated with tics failed to expose any abnormality, and even where the knee jerks were increased no departure from the usual manifestations of the tic was discoverable. It is of course permissible to suppose that a combination of the latter with organic disease of the nervous system might explain the modification of

the reflexes. In this connection it may be remembered that on one occasion we found the customary diminution of O.'s knee jerks had passed into actual loss, and although on the next day they were present again, the occurrence was suspicious enough to justify one in entertaining the idea of incipient tabes. Even if the existence of other signs had corroborated this diagnosis, the incontestable genuineness of O.'s tics would have remained, so that the attempt to correlate the derangement of the reflexes with the existence of tics is somewhat questionable.

We have enjoyed the co-operation of M. Babinski in the examination of one of our patients, L., in whom we were able to determine a definite and symmetrical exaggeration of the patellar reflexes, a slight increase in the right triceps jerk, and, in making the subject rise from a prone to a sitting position with the arms folded, a very minor degree of flexion of the thigh on the trunk.

The first of these symptoms is of no pathognomonic value, and while the others no doubt are characteristic of organic disease, their development in this instance is too imperfect to warrant the deduction of pyramidal involvement. For the last ten years L.'s motor control has been very defective. The muscular activity of the right half of his body takes the form of irregular contractions, badly timed and inaccurate in range; in spite of the absence of pain, the timidity with which they are executed hinders their ever attaining a normal amplitude; and at the same time his inability to appreciate the direction and intensity of the motor reaction, the outcome of excessive muscular vigilance, illustrates a certain loss of the sense of position of his limbs.

The existence of an actual irritative lesion is therefore problematical, and it is scarcely conceivable that

organic mischief of ten years' duration could have produced these clinical symptoms without creating graver disturbance of the reflexes, or effecting changes of a trophic nature in muscular and other tissues.

From the pathogenic and diagnostic point of view, the detection of conspicuous and persistent alterations in the reflexes is of deep significance. It is an important factor in the differentiation between tic and spasm.

Sometimes the task is unusually arduous, as when the unilateral distribution of the motor troubles recalls the clinical picture of lesions of the pyramidal paths. In L., for instance, the hemichorea and the torticollis were on the right side, and in a case published by Desterac a similar condition obtained, the writers' cramp, hip spasm, and head rotation being all confined to the right. Notwithstanding the fact that this patient had exaggerated knee jerks, ankle clonus, and a double extensor response, an opportunity for examination given to one of us made it clear that the untimely movements and bizarre attitudes were similar to what has been noted in certain cases of tic.

At the Neurological Society of Paris a case was shown by Babinski[1] of left spasmodic torticollis, with marked spasms of the left arm and left leg, and a homolateral extensor response, and it was contended that if one and the same cause underlay these phenomena—nor did there appear any adequate reason to doubt it—and if the reversal of the plantar reflex was, conformably to received opinion, to be interpreted as indicating a derangement in the function of the pyramidal system, then it was allowable to attribute the muscular spasms to the same derangement, in which circumstances the natural conclusion was that

[1] Babinski, "Sur un cas d'hémispasme (contribution à l'étude du torticolis spasmodique)," *Rev. neurologique*, 1900, p. 142.

spasmodic torticollis itself might sometimes at least be dependent on pyramidal irritation of an as yet undetermined kind.

More recently still, another patient was exhibited by the same observer,[1] in whom the association of head rotation and convulsions of the arm on the left, with increase of the triceps reflex, was conceivably the outcome of pathological stimulation of the pyramidal tract. Yet the symptoms in each of these cases were curiously analogous to what we find in mental torticollis, in which abnormalities of the reflexes are conspicuous by their absence. We ought not on that account to reject the hypothesis of concurrent organic disease, inasmuch as a structural modification may be no longer the cause but the consequence of inordinate repetition of a motor reaction. Muscular hypertrophy or atrophy may be the sequel to tics born of ideas that find motor expression, and circulatory and even cellular changes may ensue on gesticulatory excess. The objective signs that reveal the existence of a point of irritation, on the presence of which the diagnosis of spasm depends, are commonly so trivial as to be wellnigh valueless, and should they be awanting, the motor disturbance appears to be purely functional, and may be considered a tic. At the same time we must admit the possibility of mixed forms, where the functional element is linked with primary or secondary organic disease, and perhaps their occurrence is more general than is ordinarily imagined. We repeat, however, that rigorous and lengthy investigation alike of the psychical and the somatic phases of the condition, embracing the state of the reflexes, will usually furnish sufficient information to facilitate the question of diagnosis and justify a positive statement.

[1] Babinski, "Sur le spasme du cou," *Rev. neurologique*, 1901, p. 693.

### ELECTRICAL REACTIONS

The examination of the electrical reactions of the muscles concerned in a tic is a clinical method seldom, if ever, resorted to, and we can scarcely expect it to yield decisive results from the symptomatological aspect. As with the reflexes, it may happen that we cannot afford to neglect its diagnostic significance in certain cases. For example, we have had occasion to test its worth in studying the case of young J., whose trouble consisted in a clonic tic of elevation of the left shoulder, and a tonic attitude tic of the left arm whereby it was firmly applied against the body. No important alteration in electrical contractility was discovered, although the response in the upper part of the left trapezius—which, by the way, was more voluminous than on the right—was brisker than in its fellow. On the other hand, the right deltoid, sternomastoid, and pectoral, were more excitable than on the left.

Here, of course, the evidence supplied by electrical examination only served to confirm the knowledge gathered from other clinical sources.

### VASOMOTOR AND SECRETORY AFFECTIONS

Disorders of the vasomotor system rarely fail to assert themselves in the subjects of tic, but they do not in any wise differ from such as are met with in the majority of "nervous" individuals. The average sufferer from tic is emotional, and apt to betray his emotion by blushing for the most childish reason. This symptom may be in itself trifling enough, yet it may afford the earliest indication of mental instability the nature and extent of which subsequent research will determine. It is even conceivable that fear of blushing —the *ereutophobia* of Regis—may be at the bottom of

certain gestures intended to conceal the heightened colour the apparition of which is so humiliating. The form they assume is generally a movement of the arm or hand over the face, to mask the momentary discomfort, and while in most instances they are no more than stereotyped acts, they may develop into full-blown tics.

In regard to secretory affections, we have frequently observed the concurrence of hyperidrosis and emotional phenomena in those who tic. Young J., S., P., are cases in point. The slightest exertion, the least effort of attention, are followed by an extraordinary secretion of sweat, entailing constant carrying of a handkerchief in the hand, and ceaseless mopping of the forehead or temples. This performance becomes stereotyped, and is gone through even when there is no perspiration at all. Suppression of the handkerchief sometimes causes actual malaise, but this injunction must never be forgotten if a cure is to be effected.

[Persons afflicted with tic often develop a sort of visceral instability which betrays itself in indigestion, dyspepsia, constipation, diarrhœa, and in every variety of dietetic and alimentary caprice.

It is rare to meet with troubles of micturition, nocturnal enuresis scarcely deserving mention owing to its frequency among all young degenerates and to its being so commonly the outcome of neglect. Oppenheim,[1] however, considers diurnal enuresis worth including in the symptomatology, and Brissaud[2] has described polyuria and pollakiuria in association with obsessional preoccupation. These are really functional disturbances in which increased desire is followed by

[1] OPPENHEIM, *Medecinskoe Obosrenje*, 1901.

[2] BRISSAUD, "La polyurie des dégénérés," *Presse méd.*, April, 1897.

increased vesical action, and may be regarded, if one likes, as micturition or sphincter tics.[1]]

### AFFECTIONS OF SENSATION

Generally speaking, objective disturbances of sensibility do not occur, and while subjective changes are more frequent, they may be entirely lacking even in long-standing and aggravated cases. What the patients usually complain of is a more or less persistent, disagreeable, uncomfortable sensation, rarely described as painful, and often compared with a feeling of stiffness or fatigue. Or, again, they may be conscious of a sense of constriction or of dragging in the affected muscles, either at their insertions or in the muscle belly, or sometimes in the joints concerned. These subjective sensations are characterised by extreme variability in time and in degree. Moreover, the accounts given by patients of their own sufferings ought to be accepted with reserve. Not merely are they ready to exaggerate and incapable of accurately depicting and localising their sensations, but they also exhibit a curious tendency to false interpretation: they attribute an erroneous pathological significance to their feelings, and proceed to elaborate a thousand ridiculous variations, thereby inviting in a sense the eruption of fresh tics. In all this behaviour their mental imperfections are abundantly manifest.

We may remind ourselves in this connection how O.'s various inventions had no other effect than that of provoking new tics, and another illustration is to hand in the case of S., an account of whose mental torticollis will be found in a previous chapter.

[1] MEIGE, "Neue Beiträge zur Prognose und Behandlung der Tics," *Journ. f. Neurolog. u. Psychiat.*, Bd. 11, Hft. 2-3; "Tics des sphincters," *Congrès de Rennes*, 1905.

Any trifling item of passing interest used to make S. forget altogether the more or less acute pain he experienced in his neck and shoulders, and reacted no less successfully on his torticollis. When systematic and methodical exercise of the muscles was ordered, nothing was more natural than that their long period of inactivity should have the result of causing a vague feeling of stiffness in them with the unwonted action. Yet S. never dreamed of such an ordinary explanation, but pessimistically exaggerated the sensation, and deemed it an infallible sign of the spread of the disease. It proved to be a simple enough matter, however, to convince him of its harmlessness, for it was sufficient to remind him of the corresponding stiffness he had felt after his first attempts at riding and fencing, and from that moment he ceased to pay any attention to it and therefore to complain.

With spasm, on the other hand, pain is more frequently, though not always, associated. It may be said, of course, that since a tic may be evolved from a spasm, the pain of the latter is really the exciting cause of the former, but in the tic as it is constituted all these initial disturbances have disappeared, and what the patient does feel is the consequence of excess of muscular action or of articular displacement. His dolorous sensations form the sequel, not the prelude; they are not symptoms, but, so to speak, complications.

## CHAPTER IX

### THE DIFFERENT TICS

THIS chapter we shall devote to a review, necessarily incomplete, of the principal sites in which tics are to be met with. We do not pretend to have collated every known case observed up to the present, and we foresee the likelihood, moreover, of new tics coming into being. Their numbers are as unlimited as is the diversity of functional acts of which they form the pathological expression. We must content ourselves, then, with the consideration of the most familiar and most recent examples.

A rational classification would entail discussion of the various modes of derangement to which functional acts are liable, and this would demand in its turn a preliminary tabulation of function. How onerous such a task is, is patent from the uniform imperfection of the attempts already made, and the equivocal nature of their conclusions.

We have studiously avoided the designation of a tic by the muscle or muscles that determine it. To specify the precise muscle involved is sometimes attended with no little difficulty, while if several, as is customary, are concerned, their association is rarely anatomical; indeed, this is one of the chief aids to diagnosis between tics and spasms. Should the convulsion chance to follow an anatomical distribution, neighbouring muscles are apt to participate as well. Hence it is advisable to name a tic after its morpho-

logical situation, or, better still, from the functional act of which it is, in Charcot's phrase, the caricature.

This is the plan we shall pursue in our successive examination of the different parts of the body disposed to be the seat of tics.

## FACIAL TICS—TICS OF MIMICRY

Of all tics, those of the face are the most frequent, and the most easy to see. No other part is as rich in muscles whose functions are so diversified—nictitation, mastication, suction, respiration, articulation, etc. Moreover, the face is the abode of the mimic expressions, each one of which is the revelation, by muscular play, of some sentiment, or passion, or emotion. Hence the idea has been entertained of adopting a physiological classification. In the smiling tic of Bechterew, for an instance, the muscular contractions are framed into a smile in the absence of any provocative to mirth; in a similar fashion, the sniffing tic brings to mind the inhaling performances of snuff-takers.

Facial tic is frequently unilateral. It is rare to find the whole muscular distribution of one facial nerve involved, however, this being a property rather of spasm, as is also the restriction to a particular branch. A common event is the simultaneous abstention of some facial muscles and implication of others belonging to a different nerve supply.

If the condition is bilateral, as a general rule only those muscles on each side co-operate that are wont to act in concert for the accomplishment of some function. In a case reported as bilateral facial spasm by Claus and Sano,[1] in which both sides of the face and neck were affected, the exaggeration of the convulsions

[1] CLAUS AND SANO, "Spasme bilatéral de la face et du cou," *Journ. de neurologie*, 1899.

by emotion, their curtailment during rest and disappearance in sleep, coupled with the fact of their temporary arrest by recourse to subterfuge, suggest that the condition is really one of tic.

The contractions of the facial muscles are usually associated to produce a more or less complex grimace. Movements of forehead, eye, nose, or mouth, may succeed each other or be superimposed one on the other without any preconceived order, or the tic may consist in the synchronous activity of two or more muscles.

Of course any and every facial tic may occur by itself, but careful investigation will often reveal concomitant reactions of other muscular groups. The sniff that accompanies puckering of the nose indicates the engagement of the muscles of inspiration.

Facial tic, moreover, may be tonic as well as clonic, instances in point being closure of the eyelids, wrinkling of the forehead, twisting of the nose, distortion of the mouth, etc., of longer or shorter duration.

Any of the facial muscles may be attacked by tics. These commonly furnish an illustration of functional disturbance of mimicry, as in Oppenheim's cases of tic limited to the frontales, whereby astonishment or dismay was expressed, or in contraction of the superciliary muscles, which conveys a look of pain or of mournfulness. Spread to the scalp muscles may take place, causing a perpetual to-and-fro movement of the hair, of which O. and Miss R. supply examples. The platysma is sometimes the seat of a tic. One of Oppenheim's patients was a child with alternating twitches of his two platysmas; it is of interest to note he was able to contract either voluntarily. This condition is generally associated with similar contractions in other facial muscles, as in a case of facial and palpebral tic

with platysma involvement recorded by Meirowitz,[1] or as in young M.

A not infrequent accompaniment is a shrug of one or both shoulders, due to synergic contraction of the trapezius. The resulting complex may be considered an act of mimicry in so far as it is an expression of disdain.

### TICS OF THE EAR—AUDITORY TICS

The muscles of the external ear come often into play. One of our patients had a tic of the left ear, consisting in visible elevation of the pinna. A case of tic of the ear muscles has been described by Romberg, and another by Bernhardt, in the distribution of the occipital and posterior auricular nerves. Reference is made by Seeligmüller[2] to a ten-year-old girl suffering from unceasing involuntary contractions of the eyelids and of various head and neck muscles, with wrinkling of the forehead and movements of the ears. His original diagnosis of chorea was discredited by his subsequently learning that the child, in common with a younger sister and a brother, had for several years been exercising herself by making faces, and in particular by attempting to move her ears.

It is quite conceivable that certain middle-ear phenomena are comparable to the tics. O. used often to complain of hearing noises in his right ear, which came and went with his tics of face and neck. Now, it is well known that the probable explanation of the humming sound attending forcible closure of the orbiculares palpebrarum is the variation in labyrinthine tension due to the synergic contraction of the stapedius.

[1] MEIROWITZ, "A Case of Habit-spasm," *The Post-graduate*, 1900, p. 643.

[2] SEELIGMÜLLER, "Zur Pathogenese der peripheren Krampfe," *St. Petersburger med. Wochenschrift*, 1881, No. 2, p. 13.

This absolutely normal effect may be exaggerated by predisposed and preoccupied individuals into a sort of auditory tic.

### TICS OF THE EYES—NICTITATION AND VISION TICS

For the sake of precision, tics of the eyes may be subdivided into eyelid tics and eyeball tics.

A. *Eyelid Tics.*—These, perhaps the commonest of all tics, may be either unilateral or bilateral. They consist simply in a palpitation of the upper lid, repeated at irregular intervals, and differing from ordinary blinking only in augmented frequency and abruptness. The form they usually assume is that of a wink, attributable in the first instance to contraction of the orbicularis, but supplemented by the zygomatics and muscles of the nose.

The tonic variety of the same tic is constituted by a contraction of inordinate length, the outcome of which is the all but permanent maintenance of the eye in a half-closed position. The suspension of this tonic tic by volitional effort accentuates its distinction from contracture. In one of our patients a tic of this nature, which gave a singularly sleepy cast to the features, was easily relieved by suitable gymnastic treatment. The converse condition obtained in another case, where excessive gaping of the palpebral fissure contributed an unwonted fixity to the expression, which simultaneous contraction of the corrugator supercilii served to heighten into one of wild anger. These two tics corresponded to two diametrically opposed traits in their subject's character—viz. nonchalance and impatience respectively, and it is interesting to recall in this connection how the varying moods depend for their physiognomical delineation chiefly on the degree of curvature of the palpebral arc.

Valleix,[1] who employed the term "idiopathic facial convulsion" to designate tic, cites a case where even in moments of tranquillity the left eye seemed slightly smaller than its fellow, by reason of a feeble contraction of the orbicularis. Persistent grimaces of this kind resemble tics of attitude and stereotyped acts, and the possibility of their occurrence must not be overlooked, once the diagnosis of facial paralysis or spasm has been rigorously excluded.

The terms blepharospasm and blepharoclonus, sometimes applied to tonic and to clonic involuntary palpebral contractions respectively, ought to be strictly reserved for spasms and contractures properly so called. For example, von Graefe's case of blindness consequent on permanent closure of the eyelids in a child is undoubtedly one of blepharospasm. No tic could have been attended with such a result, whereas compression of branches of the trigeminal at their points of exit might determine reflex tonic contraction of the orbicularis, and so, for that matter, might a central lesion. Hence in these circumstances it is correct to use the word spasm.

Palpebral tics are among those that ordinarily begin by a spasmodic reaction to an extraneous source of irritation, such as that yielded by a foreign body, a speck of dust, an eyelash, or by any form of conjunctival inflammation.

Eyelid tics (says Parinaud[2]) are known to ophthalmologists as clonic blepharospasms. Their starting-point is always some peripheral stimulus, in particular an everyday variety of conjunctivitis characterised by the presence of granulations in the lower part of the sac. To discover these granulations it may be necessary to explore the internal aspect of the lid. In my opinion, they are a prolific cause of tic, especially in young children, and their removal effects a cure in the vast majority of cases.

[1] VALLEIX, *Guide du médecin praticien*, 1853, vol. iv. p. 617.

[2] PARINAUD, *Soc. de neur. de Paris*, April 18, 1901.

It is only when the blinking abides in spite of the suppression of the exciting cause that it can be comprised in the category of tics, otherwise the fact of its being contingent on the continuance of the irritation shows it is a spasm.

A bright light sometimes suffices to initiate these conditions. During a course of sittings for her portrait, G., a little girl eleven years of age, acquired the habit of drooping one eyelid slightly to shield the eye from the somewhat glaring light of the studio, but the persistence of this movement in other surroundings was evidence of its degeneration into a tonic tic.

Noir quotes the case of one of his colleagues who was for a long time inconvenienced by a most disagreeable blinking, which he held to be a tic; but a simple explanation was forthcoming in the unusual length of some of the eyelashes on the outer part of the upper lid having caused their entanglement with others in the under one, and when they were cut off the spasm disappeared.

In the following instance, reported by Toby Cohn,[1] the diagnosis remains undetermined:

> The protracted use of a magnifying glass in the left eye was the means, in a watchmaker, of inducing occasional localised twitches of the orbicularis, which were not slow, however, in spreading to the whole of the left half of the face. They may at first have been an involuntary motor response to nipping of palpebral twigs of the trigeminal, but at a later period their independence was constant and pronounced. With certain associated movements such as articulation or deglutition, or during the act of wiping the nose or shutting the eyes, the form they assumed was tonic. There were neither subjective nor objective sensory phenomena to note.

We have recently had the opportunity of observing a genuine case of eyelid tic, of obscure origin perhaps,

[1] TOBY COHN, "Facialistic als Beschäftigungsneurose," *Neur. Centralb.*, 1897, p. 21.

but one whose clinical features eliminate the hypothesis of spasm.

Brif., a metal polisher, forty-seven years old, came on March 10, 1902, to Professor Brissaud's clinic at the Hôtel Dieu, conplaining of involuntary closure of the eyes, especially when out walking. In his family and in his personal antecedents there was little or no neuropathic or psychopathic tendency. The sole trouble for which he sought advice was this spasmodic shutting of his eyes, rare enough under most circumstances, but aggravated instantly by a walk of even a few paces.

The onset had been quite insidious eighteen months previously, and at the first the average frequency was scarcely more than thrice or four times daily. Whenever Brif. passed into direct sunlight the movement was particularly liable to occur. As long as he remained seated at his work he was free from it, while he had but to rise and take a step or two for it to reappear and forthwith commence to repeat itself. At home any effort engaging his attention inhibited the tic, nor was there any sign of it in the course of our interrogation and examination of him.

Even when he was on his feet, the incidence of the act was not always uniform; if promenading with his wife and children, or fishing along a river side, or running to catch a tram, he was not hampered by his affliction. When he rose in the morning, it made its appearance ere he could reach the window to look out. During his journeys to and from his place of business, he was generally unable to moderate the spasmodic movements, particularly towards evening, whereas his professional pursuits in the daytime, and any occupation—such as reading the newspaper—when at home again, wholly counteracted the inclination to tic.

The production of this untimely gesture of his Brif. was disposed to attribute to the action of sun or wind, though he acknowledged the regularity of its occurrence irrespective of either. In its actual nature the contraction was tonic in type and of several seconds' duration, so that he used to cover some yards with eyes shut. From the outset the will had always exercised a marked influence on it, so much so that on certain days and for a certain space he could check the convulsion, and even when it was prolonged he contrived by volitional effort to open his eyes sufficiently to pilot himself in avoiding obstacles.

Careful search by the ordinary tests at the Quinze-Vingts hospital failed to reveal any abnormality whatever in his eyes. On our part, we satisfied ourselves that there was no restriction of the visual fields.

As far as his mental state was concerned, its chief peculiarity was a somewhat childish turn of mind, a *soupçon* of that psychic infantilism so common in the

subjects of tic; in addition, he was of an emotional temperament, and prone to perspire or blush for no valid reason. He was further a victim to a premature baldness which was hereditary in the family, and which may be cited as a physical stigma of degeneration.

B. *Eyeball Tics.*—The extrinsic muscles of the eye occasionally participate in the tics we have just discussed. Assiduous observation of patients suffering from blinking tics will enable the physician now and then to detect movements of the eyeball behind the lowered upper lid.

In the case of F., for instance, with each tic of the lids the eyeballs deviated briskly upwards and to the left. Similarly Miss R. turned her head from right to left at the same time as the eye moved obliquely to the left and in an upward direction. A patient mentioned by Otto Lerch [1] used to open and shut his eyes while rotating the eyeballs and throwing the head back. Occasionally he inclined his trunk to one or other side, accompanying the act with disagreeable little grunts.

The eruption of these tics may equally be attributed to some foreign body or minute conjunctival granulation, as was the case with a small child of ten years under our care, who, in spite of the withdrawal of the irritating particle, acquired the trick of tickling the inner surface of his upper lid by rolling his eye about whenever he happened to blink. The delight he took in this trivial manœuvre led to its mechanical reiteration, and was the means eventually of its developing into a tic which required a sufficiently delicate muscle exercise and drill for its repression.

Defects in the visual apparatus sometimes induce

[1] LERCH, "Convulsive Tics," *American Medicine*, November 2, 1901.

abnormal movements and attitudes which may become tics if careful examination does not elicit their explanation.

Tic of the eyeball is generally associated with other tics, ocular or facial, but it may occur alone and bear a resemblance to nystagmus, a peculiarity we have noticed in a patient perfectly free from any cerebro-spinal disease. It is almost always bilateral, but in some cases of unilateral palpebral tic it is more pronounced on the side of the latter.

Fixity of the eyes is characteristic of tonic tics of the extrinsic ocular muscles, and gives a somewhat haggard or maybe merely attentive expression to the countenance. Very frequently it escapes observation, and indeed cannot be considered a tic unless there be an incongruity between it and the ideas at that moment uppermost in the patient's mind.

Reference has already been made to the historic example of an ocular tic in the person of Peter the Great. A series of interesting discussions has taken place recently at the Neurological Society of Paris in regard to the question of a tic of elevation of the eyes.

The patient, who had come to consult Professor Marie at Bicêtre in December, 1899, was presented to the Society in the first instance by M. Crouzon.[1] He entered the room with his eyes fixed on the floor, but in a few seconds they had resumed their normal position in the horizontal plane. At frequent intervals he raised them upwards, or inclined his head so as to bring the pupils into contact with the upper lids, the natural position of rest of the globes being regained by a voluntary effort after each displacement. When interrogated, he complained of not being able to distinguish objects in an area of his visual fields limited by an imaginary line drawn from his eyes to strike the ground at a point six feet in front of him ; otherwise his sight was excellent. The history he gave was to the effect that five months previously, in the enjoyment of perfect mental and physical health, he had had a sudden stroke, and been

[1] CROUZON, "Tic d'élévation des yeux," *Soc. de neur. de Paris*, January 11, 1900.

unconscious for seventeen hours. No sinister results ensued till four days later, when he lost his vision, began to articulate very indistinctly, and failed to recognise his wife, continuing in that state for the next two months. Gradual recovery of speech and sight then commenced, but the habit of looking upwards persisted. The absence of injury to the visual apparatus, coupled with the presence of admitted psychical disorders, decided Crouzon in his consideration of the condition as a functional disturbance of the ocular muscles analogous to tic.

In this connection the significant observation was made by Joffroy that in the recumbent position the patient's eyes assumed their ordinary place, suggesting a comparison with those dolls whose eyes open or close according as they are held vertically or horizontally. In his opinion, the eye mobility negatived any idea of contracture consequent on central lesions.

A few months later the same patient was submitted a second time to the Society, on this occasion by M. Babinski,[1] who declared himself in disagreement with the hypothesis of M. Crouzon. In all cases of mental torticollis, so called, the contrary movement to that the execution of which is impelled by the spasm can from time to time be accomplished, whereas in the case under discussion downward as opposed to upward deviation was never obtained. Further, the acute onset, with loss of consciousness, militates strongly against the tic theory, and indicates rather a variety of paralysis of the inferior recti, or paralysis of conjugate downward movement, secondary to organic disease of the nervous system. The difficulty experienced by the patient in inducing his eyes to resume the horizontal position after once elevating them is explicable on the assumption that the action of the superior recti is no longer controlled by their antagonists the inferior recti, the former passing into a state of temporary spasm, which is, however, strictly consecutive to the paralysis of the latter.

M. Parinaud expressed himself as being in accord with M. Babinski, and recalled certain rare forms of associated ocular palsies occurring with paralysis of convergence, a combination manifest in the subject in question. Curiously enough, in these cases the disturbance of function is always ushered in by a stroke, which justifies the belief in the focal nature of the lesion.

On the other hand, it was noticed by M. Ballet that the range and facility of downward deviation varied inversely with the attention devoted to the patient by the examiner.

On yet a third occasion this identical case provided a subject of discussion at the Society, after being under the observation of Professor Pierre Marie in Bicêtre.

[1] BABINSKI, "Sur la paralysie du mouvement associé de l'abaissement des yeux," *Soc. de neur. de Paris*, June 7, 1900.

Professor Marie[1] had failed to satisfy himself of the paralytic nature of the phenomenon, and demonstrated the ease with which the eyeballs moved downwards if the patient was made to hold his head in the position of maximum extension, while in the attempt to look at his feet —the head being held normally—they were forthwith inclined violently upwards, and were so maintained for thirty or forty seconds. The only view tenable was that he was suffering from a sort of neurosis whose outward expression was this spasmodic elevation of the eyes. Additional confirmation of the accuracy of this hypothesis was supplied by a consideration of the circumstances attending the commencement of the illness. The sudden and unexpected apoplexy, of seventeen hours' duration, had been accompanied neither by stertor nor by relaxation of sphincters, and had been followed by an equally sudden return to consciousness, the faculty of speech and the desire for food reasserting themselves unexpectedly. The ensuing three or four weeks the patient had spent in a curious delirious state, not unlike the post-seizure stage of hysteria, a trace of which remained in the guise of certain eccentricities of mind. The difficulty in his speech bore a resemblance to hysterical stammering ; and, finally, his visual fields were concentrically and bilaterally restricted.

Of the subsequent history of the case some information was forthcoming at a later date,[2] corroborating the opinion originally propounded by Professor Marie. Simultaneously with the diminution in intensity of the ocular spasm there had been grave deterioration of the patient's mental level, as evidenced by the development of ideas of persecution.

In the subjects of tic, and especially in cases of mental torticollis, we have noted an analogous symptom, consisting in inability to look down at the feet, except perhaps by the aid of innumerable contortions, in contrast to the consummate ease of upward glances. By making the person write at a blackboard, and observing his action according as his hand is above or below a horizontal plane through his eyes, one can soon convince oneself of the reality of the occurrence, yet search will fail to discover any sign of ophthalmoplegia.

Patients of this class evince a remarkable aptitude for elevation movements, and the trouble they experience in depressing the eyeballs is not of necessity to be construed as denoting paralysis of the depressors, but rather indicates the presence of a tic of the elevators, as Professor Marie says—a tic born of a habit, and nourished perhaps by the dread such persons feel of witnessing an exaggeration of their convulsive movements whenever they cast their eyes down.

[1] MARIE, "Spasme névropathique d'élévation des yeux," *Soc. de neur. de Paris*, April 18, 1901.

[2] RAYMOND AND CESTAN, *Rev. neurologique*, 1902, p. 52

Our object in summarising this discussion has been twofold: at once to note the existence of tics of extrinsic eye muscles, and to illustrate the intricacies of their diagnosis.

A case not unlike the preceding, recorded by Noguès and Sirol,[1] was characterised by inability to look above a certain height without simultaneous raising of the head. Paralysis of the associated movements of elevation was excluded by the fact of the gradual onset, without an ictus, and by the absence of paralysis of convergence and of impairment of speech and intellect. Basing their conception of the case upon its post-febrile origin and the knowledge of hysterical antecedents, the authors were disposed to regard it as a neuropathic manifestation.

It is conceivable that some cases of strabismus in children are nothing more than vicious habits transformed into tics, since, as a matter of fact, attentive supervision is frequently sufficient to effect a cure, although no doubt in other cases some visual abnormality is responsible for the condition.

Finally, since accommodation is a function subservient to the will, tics of accommodation are theoretically possible. Our information thereanent must be sought from the ophthalmologists. We have met with genuine professional cramps of accommodation in those who use the microscope, as well as in opticians, watchmakers, etc.

### TICS OF THE NOSE—SNIFFING TICS

The form these tics commonly take is a puckering of the nostrils to the more or less noisy accompani-

[1] NOGUÈS AND SIROL, "Un cas de paralysie associée des muscles droits supérieurs de nature hystérique," *Soc. de neur. de Paris*, March 7, 1901.

ment of a nasal inspiration or expiration, associated usually with curling of the upper lip. They are principally the sequel to some coryza, or inflammation, or some little nasal fissure or furuncle, and in their essence constitute a derangement of a complex functional act intended to ensure the dislodgment of any obstruction in the respiratory passages of the nose, in which act the muscles of inspiration or of expiration bilaterally co-operate. Where the contraction of the nose muscles is unilateral, it is generally part and parcel of a facial grimace confined to that side, and therefore an anomaly of mimicry.

As for the pathogenic mechanism of the sniffing tic, it is simple enough. Some little passing obstacle in the air-ways, some minute, irritating sore, supply the occasion for an expiratory reaction, in the first instance, with wrinkling of the nose and dilatation of the nostrils, the repetition of which with each fresh sensation of discomfort or of pain speedily becomes automatic, and persists as a tic when mucus or abrasion has disappeared. So far from being obstinate, these tics are eminently amenable to treatment if they are uncomplicated. We have remarked on their occurrence, by the way, in the case of O. and his sister, in young J., in G., in the wife of S., etc.

### TICS OF THE LIPS—SUCKING TICS

The diversity of movement of which the buccal orifice is capable warrants the statement that the tics of this class are almost too numerous for detailed description. At times only the orbicularis oris is involved, unilaterally or bilaterally; at others, concomitant implication of the elevators and depressors of the lips, or of the chin muscles and the platysma, furnishes the basis for all sorts of pouting, biting, and

sucking movements, and for every variety of smile and grin. Here again the clonic form of contraction is the most habitual, although that rapidity and abruptness which we commonly identify with such contractions may not always be conspicuous. Guinon says of a young patient of his, at one time addicted to innumerable tics, that the relative sluggishness with which she opened and shut her mouth served to inspire belief in the reality of the tonic tic of certain authors. As a matter of fact, tonic tics do exist, and are sometimes associated with another variety known as mental trismus, to the discussion of which we shall revert ere long.

The action of the muscles of the lips is manifold: whether in the expression of the emotions, or in the discharge of different functions, they come into play in miscellaneous modes that may be the forerunners of a multiplicity of tics. Of these, two types may be distinguished, according as expansion or occlusion of the labial orifice predominates. Under the one heading come the caricatures of ordinary smiling or laughing, under the second those that exaggerate the pursing or pouting movements whereby we are wont to indicate chagrin, repugnance, disdain, etc. Labial tics of this nature may be styled tics of facial mimicry.

In the infant that has long been weaned, and *a fortiori* in the adult, the continuance of the act of sucking must of course be considered a functional anomaly; and while no doubt it is true we use our lips in imbibing a beverage through a straw, or in extracting the juice from a fruit, the action is different from that of the infant, and in any case not to be compared with incessant sucking of tongue or thumb, or of some object devoid of all nutritive value—merely a bad habit, perhaps, but frequently indistinguishable from tic.

The most fruitful source of the tics under consideration is to be found in labial cracks and dental mischief. More especially in children, towards the end of the first dentition, the torment of loose teeth calls forth interminable devices for relief, in seeking which tongue and lips pleasurably co-operate. Once the tooth is out, the lacuna it leaves provides a new sensation and a new reason for muscular activity. Irregularity of the permanent teeth may also be referred to as a potent factor in the causation of tic. It is therefore not superfluous systematically to examine the teeth of all patients suffering from tics of the mouth, and to extract any offender.

### TICS OF THE CHIN

The muscles of the chin collaborate with other facial muscles in expressional movement, and are similarly liable to be the seat of tics.

Massaro[1] has observed an interesting series of isolated "geniospasm" occurring in twenty-six individuals of the same family during five generations. The characteristic feature of these spasms was an involuntary intermittent clonic contraction of the transverse muscles of the chin, suggesting the look of one seized with fear or with cold. The will did not always effect their inhibition, while emotion appeared to aggravate and distraction to abate their intensity. With sleep they vanished entirely.

### TICS OF THE TONGUE—LICKING TICS

Tics confined exclusively to the tongue are of rare occurrence. Moreover, they must be strictly differentiated from the tonic or clonic contractions of the

[1] MASSARO, *Il pisani*, fasc. i. 1904.

tongue muscles met with in hysteria, epilepsy, and Sydenham's chorea, from the varying tremors that accompany organic disease of cerebral or bulbo-pontine origin, as well as from those "glosso-spasms" that may or may not be associated with twitches of the facial musculature.

Functional polymorphism is no less marked in the case of the tongue than in that of the lips; it participates in suction, mastication, deglutition, as well as in respiration, phonation, and articulation, while to "put out the tongue" at any one is equivalent to an expression of contempt. It is, accordingly, no surprise to find the number of tongue tics very considerable. Such, for instance, is the licking tic, where the tongue is constantly being passed over the free border of the lips, moistening them to excess; or the chewing tic, in which its perpetual motion inside the mouth in every direction conveys the impression that the subject is chewing something. Further, its contact with the palate or the upper lip may yield different clucking, whistling, or crowing sounds. Letulle remarks that the trick of producing a little inspiratory whistle by the passage of a column of air through an incompletely closed labial commissure—a common habit among people suffering from dental caries—is not slow in developing into an actual tic.

It has not fallen to our lot to observe the tonic variety of tongue tics, none the less must we believe in the possibility of their occurrence. Convulsive lingual movements, consecutive to disease of mouth or teeth, or to lesions of corresponding nerves, are in all probability spasms properly so called, to which disturbances of sensation and of nutrition are often superadded. The tonic contractions of tongue, lips, and masseters, which have been described in cases of hypochondriasis and puerperal psychosis, are much more

nearly allied to the tonic type of tic, if, indeed, they are not to be identified with it. A case has been put on record by Lange of tonic contraction of the tongue during speaking and eating, each time that it touched the dental arches. No doubt the condition was a sort of tonic tic. Sometimes players of wind instruments are afflicted with a "professional cramp" of the tongue, as Strümpell has reported.

Generally speaking, however, it is particularly in tics of language, and in the various kinds of stammering, that the tongue muscles are concerned.

### TICS OF THE JAWS—BITING TICS—TICS OF MASTICATION

When the muscles of mastication are the site of tics, a medley of nibbling and mumbling results, from which convulsive movements of the same muscles consequent on cerebro-spinal mischief must be scrupulously separated. A. von Sarbo's[1] case of clonic maxillary spasm secondary to worry, depression, and an accident to the head, in a woman thirty-four years old, and otherwise free from stigmata—analogous cases are quoted by Strümpell and Ranschburg—was referred by him to a "spasm diathesis," akin to the "diathesis of contracture," but its etiology and evolution, together with a striking exaggeration of the knee jerks, negative the hypothesis of tic.

The masseters are chiefly but not exclusively affected. Unilateral implication of the pterygoids has been noted by Leube in a young girl who was also an hysteric and a choreic. A patient of ours prefaces every conversation by rapidly raising or lowering his inferior maxilla four or five times, and blinking at the

[1] A. von Sarbo, "Ein Fall von klonischem Masseteren Krampf," *Monatsch. f. Psych. u. Neur.*, 1900, p. 493.

same time; the performance has its variants, moreover, with the occasional addition of several nasal expirations.

Chattering or grinding of the teeth is a frequent accompaniment of the tics we are considering, and may have a disastrous issue in the loosening, cracking, or breaking of these structures, as in the case of O.

A still more common incident is injury to the buccal mucous membrane, a significant instance of which is furnished by an episode in the history of young J.

One day in June, 1900, J. experienced a feeling of discomfort in the articulation of the lower jaw—the sequel, as a matter of fact, to a slight alveolo-dental periostitis in the neighbourhood of a bad tooth—and, interpreting the sensation as a new and grave symptom in the march of his malady, forthwith proceeded to investigate its development by playing with his maxilla. Then ensued a perfect debauch of masticatory movements, in which agreeable repetition of every conceivable grimace was joined to protrusion and retraction of the jaw in the search after articular cracks. He became so wholly preoccupied with this tic of mastication that ere long he had begun to pinch the mucous membrane on the inside of the right cheek between the hindmost molars, and this fresh object of absorbing attention in its turn led quickly to some excoriation of the mucosa on both sides. No halt was called by the lower jaw to give the abrasions time for repair, with the natural outcome that they suppurated and paved the way for an attack of infective stomatitis with pain, fever, and malaise, which necessitated the application of the thermo-cautery to the ulcerated areas for its relief.

The explanation given by the patient of the evolution of the process was controlled by interrogation of the parents, and no doubt was left as to its genuineness. In the attempt to dispel the articular discomfort, he had accidentally bitten himself, but the consequent pain did not deter him from repeating and continuing the act until its execution was irresistible.

In these and similar cases, the infelicitous rehearsal of the movements of mastication is practically always associated with an imperative desire to experience a sensation at the place actually bitten. *Cheilophagic* children, who bite their lips unceasingly, usually commence by nibbling at some half-separated fragment

of epithelium on the edge of a labial fissure, with the inevitable result that the erosion is enlarged and fresh particles of the mucous membrane are detached. Youthful candidates for tics can scarce escape from the vicious circle. A juvenile patient of ours, F., was in the habit of gnawing so vehemently at the most insignificant little irregularity of the mucosa that his lips were constantly chapped and bleeding, and as they were no less constantly being moistened by saliva, a succession of new cracks made their appearance, to be promptly torn apart by the teeth. Local applications of nauseous substances are not always sufficient to discourage these young "cheilophagics."

It is still more frequent to meet with *onychophagia*, a condition rightly held to be a stigma of degeneration, and acknowledging the same pathogenic mechanism as all biting tics.

So much for the clonic tics of mastication: we pass on to review the tonic forms, the most curious of which has received the name of *mental trismus*.

## MENTAL TRISMUS

The characteristic feature of this tonic tic is an all but permanent contraction of the masseters, which may, however, be completely relaxed by making the subject put out his tongue, show his throat, etc. It may be maintained during the act of speaking. Its intensity and its persistence alike stand in rigorous relation to the nature and degree of the mental affection that provides its occasion. In the insane it may become so absolute an obstacle to nutrition that recourse must be made to nasal feeding. Mental trismus resembles mental torticollis in that any proceeding to which the patient attributes a special inhibitory virtue is adequate to correct it, as, for instance, the insertion of a cork

between the teeth,[1] or the placing of a finger on the incisors.[2]

It must of course be clearly understood that the diagnosis of mental trismus can be arrived at only after previous elimination of every possible source of confusion, such as tetanus, more rarely tetany, meningitis, and acute bulbar paralysis, in addition to other mesencephalic and perhaps also certain cortical lesions. One is inclined to be less dogmatic where tonic or clonic convulsions of the jaws succeed violent fright, as in a case of trismus of nine months' duration recorded by Billot and Francotte. For that matter, trismus is met with in hysteria, and may be regarded as a manifestation of that disease, although this cannot always be invoked as its cause. We are not attracted by Kocher's idea of assigning it to an "idiopathic spastic neurosis," preferring to ally it to tics of the tonic variety.

Among the crowd of circumstances that reflexly give rise to trismus may be enumerated abscess, caries, alveolo-dental periostitis, eruption of the wisdom teeth, disease of the maxilla and the neighbouring soft parts, and less commonly myositis or injury to the masseters. But so long as any one of these causes is in operation, and especially if the affection be attended with pain, we are dealing with a trismus spasm, not a trismus tic.

S., whose psychical imperfections have already formed the subject of remark, supplies an example of the combination of mental trismus and torticollis, the former being the outcome of an inopportunely reiterated voluntary act, and therefore comparable to the tics.

S. speaks with clenched teeth. His masseters are generally in a state of contraction, yet when he is requested to put out his tongue or to open his mouth, and when he is eating or engaged in an animated

[1] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 381.

[2] CHATIN, *Rev. neurologique*, 1900, p. 310.

conversation, any and every movement of the inferior maxilla is accomplished with the greatest ease. According to his story, this tonic tic of the masseters had its origin in the forcible efforts he used to make to master his torticollis, in the course of which he would close his mouth firmly; by dint of continual repetition the habit developed into a tic, and persists apart altogether from any endeavour of his to prevail against the wryneck.

One of us has had a recent opportunity of examining a young woman whose obsessions and fixed ideas, and tics of face and neck, indicated an extreme degree of mental instability, in spite of intellectual power above the average, in whom trismus of this type was very obvious during eating and speaking. No effort, however concentrated, to open the mouth was then of any avail; yet, on the other hand, she could sing to perfection, and she could yawn, or show her tongue or her throat, in an entirely easy and normal fashion.

The appearance of this trismus during the performance of certain functional acts, and of these alone, is unequivocal evidence of its mental derivation.

### TICS OF THE NECK—NODDING AND TOSSING TICS—TICS OF AFFIRMATION, NEGATION, AND SALUTATION

Regionally considered, the neck is second only to the face in furnishing the greatest number of tics. Convulsive movements of the neck muscles produce displacement of the head in all sorts of ways and directions, giving rise to clonic tics of affirmation, negation, and salutation, and to nodding tics, as well as to an important group of tonic tics which find expression in differing forms of torticollis. The latter are so distinctive in symptomatology and evolution, and have been the centre round which so much discussion has raged, that a chapter must be set apart for their special study.

Restricting ourselves for the present to such as

are included in the category of clonic convulsions, we find here abrupt vertical or horizontal movements, as well as intermediate varieties compounded of elevation, depression, inclination, or rotation. The most ordinary kind is a sudden, brief jerk or toss of the head, repeated at irregular intervals, and followed by instantaneous resumption of the primary position.

Certain convulsive affections—for instance, the *spasmus nutans* of young children, the salaam tic, and what are known as "baboon movements"—are still rather obscure and in many cases seemingly not equivalent to tics. Their occasional association with strabismus or nystagmus constitutes a plea for their possible dependence on some encephalic lesion. In two cases under Oppenheim's observation the nodding spasm appeared solely in the hours of the night and during sleep. From want of more precise knowledge we must confine ourselves to the remark that conditions analogous to, though not identical with, the tics, in addition to others more specifically hysterical, have probably been incorporated with them.

It is a task of peculiar difficulty to determine the share in the final product to be apportioned to individual muscles, of which the sternomastoids, as being the most superficial and the most obvious, are apparently comprised the oftenest, though the trapezius and the muscles of the underlying strata, such as the splenius, complexus, and other smaller ones, may also assist.

According to Guinon, isolated contraction of one sternomastoid, whereby the head is rotated and inclined once or twice or several times consecutively, to the usual accompaniment of facial contortions, is very frequently to be noted. If there occur simultaneous contraction of the platysma, its fibres will be seen to line the cervical integuments longitudinally from the chin to the infraclavicular fossa. Synchronous involvement of the two sternomastoids will flex the head

and approximate the chin almost to the sternum, but more commonly there is only a slight forward inclination of the head exactly similar to a gesture of assent. Extension and lateral deviation are less generally encountered.

Extreme variability characterises the exciting causes of these tics. It has been remarked more than once that insecurity of the headgear the subject happens to be wearing ought to be blamed; instead of readjustment with the hand, a little toss of the head will make the hat sit properly, and one need not search further afield for the germ of the patient's tic. We have been able to trace this mode of inauguration quite as conspicuously in young men as in young women. Prohibition of unstable head coverings and resort to exercises of immobilisation suffice for the tic's correction in early cases.

A not infrequent accessory symptom—viz. elevation of the corresponding shoulder—may have a similar origin in peripheral excitation connected with the patient's clothing. To escape the annoyance of a high and narrow collar, or, on the other hand, to experience an agreeable sensation by rubbing the skin, it is a very simple and a very easy matter to lean the head on the shoulder, and to raise the latter at the same time. The automatic reproduction of this gesture eventually ends in the formation of a tic which removal of the collar entirely fails to suppress. The first therapeutic indication, nevertheless, is to interdict the wearing of the unsuitable collar, and to recommend the adoption of others softer and more ample. Whatever be the opinion one holds on the mechanism of tic, the influence of peripheral stimuli is, according to Pierre Marie,[1] very considerable, and it is his invariable practice, in the case of youthful subjects, to impress on the parents the desirability of paying

[1] PIERRE MARIE, *Rev. neurologique*, 1901, p. 426.

special attention to their children's clothing, and of discarding any article that is either stiff or heavy.

In one of our cases, a girl A., suffering from a nodding and rotatory tic of the head, examination of the cervical region revealed the existence of a line of cicatrices along the margin of the sterno-mastoid, the vestiges of a previous operation for a severe tuberculous adenitis. Some nerve filaments entering the sternomastoid and trapezius had no doubt been cut, since these muscles presented a minor degree of atrophy, and the irritation arising therefrom, as well as that due to dragging on the adhesions between the cicatrices and the underlying tissues, had been the starting-point of a motor reaction primarily convulsive and involuntary, but eventually habitual and automatic, and therefore, with the subsidence of the excitation, a tic.

In another case[1] a month's systematic treatment served to curtail to a noteworthy extent spasmodic head movements resembling those one makes to get rid of a fly.

From another point of view, some of the tics of this class are merely the exaggeration of certain functions destined for the expression of the ideas of affirmation and negation. The nod of the head with which little G. used to punctuate his "yes's" was logical enough, but he soon began its repetition irrespective of his topic of conversation, and even when saying "no"—a veritable tic of affirmation.

Numbers of people are in the habit of emphasising their words with those to-and-fro movements of the head that we call gestures of approval. Now, if the gesture be strictly appropriate to the thought present in the mind, it cannot be identified with the tics. On the other hand, its execution may be inopportune, in which case, provided the form remain normal, it is merely a stereotyped act, and must exhibit the additional features of abruptness and exaggeration ere it rank as a tic.

[1] BRISSAUD AND FEINDEL, *Journ. de neurologie*, April 15, 1888.

It is chiefly among the mentally infirm, such as idiots and imbeciles, that the phenomenon of salutation occurs, and as its rhythm is an element which is foreign to most ordinary tics, it is not likely to be confounded with them.

These conditions apart, however, there is one highly specialised clinical type that merits separate study—viz. mental torticollis.

### MENTAL TORTICOLLIS

The medical world has long been familiar with various kinds of permanent or intermittent torticollis presumably unconnected with muscular, articular, or osseous lesions of the neck, and been as long divided on the question of their tabulation.

Instances of this affection, bearing such widely differing names as "hyperkinesis of the accessory of Willis," "spasmodic torticollis," "functional spasm of the neck muscles," "rotatory tic," etc., have abounded in medical literature ever since the days of Duchenne of Boulogne, Trousseau, and Charcot. Some twelve years ago now, the term mental torticollis was applied by Brissaud[1] to a type of convulsion of the neck musculature whose association with psychical disturbances justified its description as a tic, and his opinions have been abundantly confirmed by later observation.

As a matter of fact, mental torticollis is a tic which the patient can ordinarily curb by some procedure of his own invention. It has its *raison d'être* in his mental imperfection. To obviate misunderstanding, we must premise that the latter term is not synonymous with mental alienation. It merely signifies that lack of

[1] BRISSAUD, "Tics et spasmes chroniques de la face," *Journ. de méd. et de chir. pratiques*, January 25, 1894.

mental balance, to whatever extent, that is patent in all sufferers from tic.

From the motor aspect the tic under consideration may be characterised as a functional disorder, consisting in the illtimed, inapposite, unceremonious, and exaggerated repetition of the function of head rotation. Notwithstanding the large number of muscles involved, the various modifications of movement possible, and the consequent complexity of clinical types, each individual case is recognisable as a tic. Let but momentary cessation of the muscular spasm be effected, and the torticollis disappears without leaving a trace. Instantaneous and total prevention is in practically every case attainable by resort to some subterfuge, however vehement be the patient's contortions.

This device, whatever it be, may be called the "efficacious antagonistic gesture," of which the simple placing of the index finger on the chin may be cited as an example. Its field of operation is not limited to mental torticollis, and we shall have opportunities of observing its working in greater detail in other tics; but in the former affection the constancy of its occurrence and the facility of its detection combine to enhance its diagnostic value.

We hasten to remark, however, that conditions other than those we have just mentioned are capable of producing convulsive movements in the muscles of this region. In addition to such osseous, articular, and muscular alterations as may determine a more or less permanent torticollis, certain nervous lesions are apt to be succeeded by the development of the spasmodic form, no longer as a tic, but as a true neck spasm, the due recognition of which may be a matter of no little perplexity.

Confining our attention for the present to torticollis tic—the mental torticollis of Brissaud—we notice, in the

first place, that it affects either sex indifferently. The age of our youngest patient was eighteen, though in a case of Raymond and Janet's the disease made its appearance four years earlier. A hereditary neuropathic or psychopathic factor is invariable, but similar heredity is the exception. Paternal alcoholism has been quoted by Guibert as a possible predisposing cause, also a rheumatic diathesis (Bompaire), family trembling (Feindel), hereditary stammering (Noguès and Sirol), nervous and mental disease in the parents (Feindel and Meige). One of Oppenheim's patients had a peculiarly sinister family history: the grandparents were related by blood, one being a diabetic as well, and the other a lunatic; the mother was nervous, and the sisters either epileptic or psychically abnormal. This case was characterised by the existence of generalised tics in childhood, and by the development of torticollis soon after marriage.

Among personal antecedents may be noted hysterical attacks (Sgobbo), emotional unrest (de Buck[1]), migraine (Brissaud), neuralgia (Bompaire), irritability, eccentricity, caprice, absentmindedness, neurasthenia (Brissaud and Meige[2]). Other favouring circumstances are moral shock, intense and prolonged emotion, remorse, preoccupation (Bompaire, Sgobbo, Brissaud and Meige, Grasset). Purely extraneous causes seem sometimes to be the starting-point; for instance, toothache and dental inflammation (Souques[3]), pain in the neck from carrying heavy loads (Amussat[3]), chill (Legouest, de Buck, Guibert[3]).

At the Congress of Limoges a case was reported

[1] De Buck, "Spasme fonctionnel du cou," *Belgique médicale*, 1897, No. 51.

[2] Brissaud and Meige, "Trois nouveaux cas de torticolis mental," *Rev. neurologique*, 1894, p. 697.

[3] Cited by Bompaire, *Thèse*.

by Lannois where the onset of torticollis in a young girl was determined by an overpowering impulse to gaze at a little papilloma on her nose. The extirpation of the growth was followed by an amelioration of symptoms that amounted substantially to a cure.

Mental torticollis consecutive to anthrax of the neck has been described by Briand.

Other conditions that have been invoked as possible causes are the intoxications and infections, alcoholism, saturnism, mercury poisoning, typhus, pneumonia, paludism, etc. Oppenheim has signalised the reappearance, after several months of respite, of a torticollis secondary to an attack of influenza. Overwork, accident, occupation, have in their turn been suggested. In some cases, as a matter of fact, it does seem that the last is of some import, since the incidence of the torticollis is to a certain extent on those muscles that have been actively employed in the pursuit of a profession, and they thus acquire a sort of functional hyperkinesis.

Graff's[1] case of clonic convulsive contractions of the left splenius, left deep rotators, and right sternomastoid, occurred in an individual obliged, when carrying heavy loads, to maintain his head in a fixed position to the left, and unable thereafter to turn it to the right.

In some quarters no little importance is attached from the pathogenic point of view to the actual state of the muscles, and in particular to atrophy or hypertrophy of the sternomastoids. Féré holds that sometimes unilateral atrophy may occasion abnormal contraction of the opposite muscle, but such muscular changes are, in our opinion, much less likely to be the cause than the consequence of reiteration of movement or conservation of attitude. Legenmann's case was one of

[1] GRAFF, "Ein Fall von spastischen Krämpfen der Halsmuskulatur," *Deutsch. med. Wochenschrift*, March 22, 1900, p. 66.

tonic and clonic convulsion of the right sternomastoid where there was a cartilaginous tumour in the left.

The rôle played by ocular affections, by troubles of vision and of accommodation, in the genesis of wryneck is frequently no insignificant one, and it is curious how often patients attribute the mischief to the strain of overwork in bad light. Strabismus (Walton) and ocular palsies (Nieden) have also been known to lead to lateral deviation of the head and permanent torticollis. There has been described a variety *ab aure læsa*.

Albeit these factors have a share in determining the gesture and attitude adopted by the patient, the resulting torticollis is not of necessity mental. That which, according to Romberg, is provoked by compression of supraclavicular nerve filaments is unmistakably a spasm.

To establish the diagnosis of mental torticollis, the existence of those psychical anomalies that are common to all who tic must first be substantiated, and then must one essay the reconstruction of its mechanism. The inquiry may at first prove fruitless, of course, but continuation of the search can scarcely fail to elicit tokens of mental infantilism. In pursuance of this quest we shall find ourselves face to face with the "big baby," the personification of childishness, obstinacy, and caprice; we shall encounter the peevish, the sulky, the whining; we shall see how their impotence in presence of their tic turns their nonchalance to profound despair, how their failure to adapt themselves to their malady convicts them remorselessly of volitional imperfection. The utter weakness of their will, according to Déjérine, justifies their being ranked as neurasthenics; but in the latter class of case obsessional ideas are both fugitive and fluctuating, whereas mental torticollis is dependent on a fixed idea of peculiar tenacity.

There can be no doubt that such patients, however undimmed their intellectual powers may remain, ultimately fail before the everlasting obsession of their disease, and if in some cases interest in daily life and work continues unabated, a multitude of others become indifferent and apathetic, and sink into a state of physical and moral infirmity.

To retrace the steps in the evolution of mental torticollis is a task not always easy of accomplishment. Very commonly the affection supervenes as the sequel to the unhindered repetition of a once voluntary purposive act, a repetition become tyrannical through volitional debility. One or two extracts from published cases will serve to illustrate the truth of our contention.

1. To escape the pain of a dental abscess on the right side, of only four or five days' duration, the patient had acquired the habit of turning the head to the right and maintaining it so for as long as possible at a time. Very shortly after the healing of the abscess, the head commenced to move involuntarily towards the same shoulder (Souques [1]).

2. Occipital neuralgia and pain in the neck led the patient to try various positions to allay the agony, in the course of which he found that rotation to the right brought transient relief. By dint of repetition the movement became involuntary (Brissaud and Meige [2]).

3. In this case the subject used to spend the whole evening inert, arms folded, without reading or working, tilting his head forwards or backwards to rediscover a "cracking" in his neck from which he suffered—a proceeding that gradually developed into a tic (Brissaud and Meige).

4. A schoolgirl was dissatisfied with the place allotted to her in the schoolroom, and pretended that she felt a draught on her neck coming from a window on her left. The initial movement was an elevation of the shoulder as if to bring her clothes a little more closely round her neck, then she commenced to depress her head and indicate her discomfort by facial grimaces, and these eventually passed beyond voluntary control (Raymond and Janet [3]).

5. In order to deceive his friends, the patient assumed a forced

[1] Cited by BOMPAIRE, *Thèse de Paris*, 1894.

[2] BRISSAUD AND MEIGE, *Rev. neurologique*, December 30, 1894, p. 697.

[3] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 378.

attitude of gaiety when really sick at heart, by inclining his head, raising his shoulders, and arching his back, and at the end of a few months a bantering remark revealed the surprising fact that he could not correct the position (Raymond and Janet[1]).

6. A woman used to pass the day sewing or knitting at her window and amusing herself from time to time by pensively looking out into the street. Not long afterwards she noticed how much more pleasant it was to allow her head to turn to the right, and how troublesome it was to keep it straight. At length she found this impossible, except with the aid of her hands (Sgobbo[2]).

7. Worried by severe occipital pains, an individual became so concerned to find they were being replaced by a feeling of great weakness, that he let his head rest by inclining it now and then to the left, an act which he is certain was the cause of his torticollis (Feindel[3]).

One further instance may be cited from Séglas,[4] where a neurasthenic lady, fifty years old, had been for three years a martyr to vague pains which finally settled in her neck, and asserted themselves on the slightest exertion. She sought to mitigate her sufferings—a veritable topoalgic obsession—by leaning her head on her shoulder, and the desire thus to procure alleviation gradually became irresistible and the movement unconscious.

Multiplication of examples is unnecessary. It is abundantly evident from the above that the repetition of a deliberate and voluntary functional act, co-ordinated and systematised, is the first step in the genesis of mental torticollis.

The mere memory of a frequently repeated movement, especially if the latter occur in the prosecution of one's avocation, may determine the type of torticollis, as in Grasset's "post-professional colporteur tic," to which reference has already been made.

In the case of one of our patients, N., the prolonged and almost exclusive use of certain muscles in the

[1] RAYMOND AND JANET, *loc. cit.* p. 380.

[2] SGOBBO, "Un caso di torticollo mentale," *Il manicomio moderno*, 1898, fasc. 3.

[3] FEINDEL, "Le torticolis mental," *Gazette hebdomadaire*, February 20, 1898, p. 169.

[4] SÉGLAS, "Un cas de torticolis mental," *Rev. neurologique*, 1901, p. 114.

course of his business decided their involvement in the condition of practically permanent torticollis with which he was afflicted, and which was due to strong contraction of the right trapezius and sternomastoid. It appeared that for eighteen years he had been a cutter in a linen draper's, where it had been his duty, for hours at a stretch, to cut rolls of stuffs with a large and heavy pair of scissors, and in the execution of this work the right arm was extended, the hand firmly pressed on the table, the shoulder elevated, the head rotated and inclined to the left.

We cannot do better in this connection than recall the cases referred to by Brissaud[1] when directing attention for the first time to this variety of tics of the neck.

Here is a patient with energetic contraction of the muscles which depress the head on the neck. She holds her head in her hands to inhibit the movement, and succeeds. And she is quite convinced that the force requisite for rectifying the vicious attitude is not simply the power of her will acting on the muscles concerned, but the strength of her hands. She has unconsciously doubled her physical personality; her hands obey her will, her neck does not. At least, this would appear to be the key to the situation, for it can be well understood how much easier it would be to readjust the position by action of the antagonist cervical muscles than by the hands. The contraction, moreover, is entirely painless. It is a trivial act of obsessional insanity, provoked by some or other insignificant psychomotor hallucination.

Take this next man, who also must needs keep his head straight by means of his hand—obviously no irritation of the spinal accessory can be accused of originating the mischief, else would he be unable himself to replace his head. It is merely the idea that is urging him to its rotation. Try by force to prevent him from twisting his head round, or try to twist it against his will, and the difficulty of the thing will be at once comprehended. Or try to pull your own two hands apart to see which is the stronger, and you will never succeed, for the simple reason that abstraction of the will is impossible. One hand can prevail over the other only if both consent; the left cannot be in ignorance of what the right is doing. A "partial" or "local" will is inconceivable; there cannot be one for the head and another for the arm.

[1] BRISSAUD, *Leçons sur les maladies nerveuses*, 1895, p. 514.

Here is a third patient, presenting an identical muscular spasm. He is content to apply two fingers to his chin to overcome the otherwise irresistible bend of his head to the right. Such has been the situation for the last five years. No line of treatment has made any impression on this neurosis, to which two factors contribute, though one cannot say which predominates—an unconscious, imperious, motor impulse, and a conscious though ill-informed volition, powerless to arrest the convulsions by simple and normal media, and obliged to resort to a puerile artifice, to a sickly sort of deceit. The opposition furnished by two fingers only cannot be of any avail, yet, however feeble be the succour, the patient's imagination is thereby appeased.

Such (adds Brissaud), fashioned in the same mould, are the "mentals" of whom I have been speaking. Recollect the ungovernable impulse they feel to execute a convulsive movement that their will might thwart; remember, therefore, at the same time, their volitional enfeeblement.

Brissaud's earliest observations were followed at no long interval by various articles, first of all the thesis of his pupil Bompaire,[1] then others in collaboration with ourselves. The more recent publications of Lentz,[2] Sgobbo, Noguès and Sirol, Raymond and Janet, Séglas, Etienne Martin, etc., may be mentioned, as well as a contribution by Grasset,[3] notable alike for the case it contains and for the author's interpretations.

The view that considers of prime importance the psychical phenomena of this affection has received general confirmation. We have seen protracted cases of "spasm of the accessorius" cured, exactly as with the tics, by widely differing therapeutic agents. In numerous instances, according to Oppenheim, torticollis is not consecutive to any peripheral or central change in the nervous system, but rather indicates irritability of nerve centres. It is probable that the kinæsthetic centres in the cortex for the neck muscles are the seat

[1] BOMPAIRE, "Du torticolis mental," *Thèse de Paris*, 1894.

[2] LENTZ, "Rotation permanente de la tête à droite," *Journ. de neurologie*, 1897, p. 502.

[3] GRASSET, "Tic du colporteur; spasme polygonal post-professionnel," *Nouv. icon. de la Salpêtrière*, July—August, 1897, p. 217.

of the lesion, and that their congenital and hereditary imperfection fixes the form the convulsion will take.

These and similar facts are well calculated to corroborate the opinion that mental torticollis is nought else than a form of tic. The subjects of the disease are satisfied of two things—that no one and no circumstance can hinder their torticollis from asserting itself, and that their own antagonistic gesture is the sole efficacious preventative at their command. The attempt to put the displacement right evokes acute pain and stimulates opposition on their part. They prefer the display of considerable resistance to the renunciation of their satisfaction in their tic, and follow up any momentary restraint by a riot of inco-ordination, in recompense for the brief sacrifice they have made to preserve immobility.

The muscular contraction that deviates the head may be either clonic or tonic, bringing it to one side by a series of convulsions and allowing it to resume its original position in the intervals, or forcing it to maintain a vicious attitude for hours. Innumerable variants may occur, indeed are the rule, even in the same patient. In short, though mental torticollis may generally be classed as a tic of attitude, it matters but little whether the adoption of the attitude or the attitude adopted constitutes the tic. They are simply two successive phases in the same abnormal muscular act. The most elementary movement is rotation of the head; it may equally well be inclined on one shoulder, or be both inclined and rotated to one side, or it may be inclined in one direction and rotated in the other. There may be accompanying elevation of the shoulder, or the act may become a much more complex one, involving neck, shoulder, and arm.

Each and all of the neck muscles may take a share in the torticollic movement, but some are more commonly

affected than others, in particular the sternomastoid, whose contraction may either be isolated,[1] or modified by trapezius, splenius, levator anguli scapulæ, etc., of the same or the contralateral side. It is frequent to find the head inclined to one side and rotated to the other by the action of the sternomastoid, or displaced backwards and slightly turned to the side of the contraction by means of the splenius. If the sternomastoid and homolateral trapezius are acting together, torsion of the neck is very pronounced and the skin over that area is deeply lined.[2] It may happen that the head is rotated and inclined to the same side, as in Grasset's case, where the curious combination occurred of clonic convulsion of left trapezius and pectoralis major with right pectoralis major and sternomastoid. In the same patient the left arm was pressed against the trunk and the right extended posteriorly.

There are other instances where it would be more accurate to speak of *retrocollis*, as in a case recorded by Brissaud, or *procollis*, the two sternomastoids contracting synchronously, as in another case due to Duchenne of Boulogne. The extreme degree of flexion induced in this way was neutralised immediately by supporting the head; the adoption by the patient of a reclining position sufficed to inhibit the tic's manifestation.

Intensity and frequency of movement, duration and deformity of attitude, all alike may vary in the same individual at differing times. Solitude, tranquillity, and repose favour the diminution and even the entire disappearance of spasmodic movements which fatigue, anxiety, and emotion are prone to exaggerate. An in-

[1] MARÉCHAL, "Un cas de torticolis spasmodique," *Journ. de neurologie*, 1899, No. 11.

[2] REDARD, *Le torticolis et son traitement*, Paris, 1898.

structive case in point is one of van Gehuchten's,[1] the subject being a labourer twenty-five years old, in whom a tic of the right arm and right sternomastoid of seven years' continuance disappeared whenever the patient was by himself, to burst out afresh as soon as he was conscious of being observed.

Distraction is a valuable sedative. A patient of ours used to pass the day in twisting his head round with ever-increasing violence, while at night, amid the smiling gaiety of the theatre, hours slipped by without his betraying the least suspicion of his malady.

Occupation, on the other hand, may provoke the condition. Duchenne has a reference to a case where rotation of the head to the right commenced whenever the subject started to read, and ceased only with the laying down of the book. In one of our cases the head kept turning whenever and as long as the two hands were simultaneously engaged in some pursuit. If one hand was disengaged, there was no torticollis.

As a general rule, excitement invites or increases movement, whereas sleep frustrates it, and after a good night's rest several minutes or even an hour or two may elapse ere the convulsions reassert themselves.

Acute pain is rarely met with in the disease we are considering, but sensations of discomfort, of tension, of strain in the muscles, form a common subject of complaint.

By way of example may be cited the case of one of our patients:

L. is eighteen years old, and has been suffering from torticollis for the last six weeks. The chief movement is abrupt rotation and very slight inclination of the head to the right, and the muscles principally concerned are the left sternomastoid and the right splenius. The head is sunk between the shoulders, of which the right one is elevated synchronously with the rotation, and remains so as long as the latter persists.

[1] Van Gehuchten, "Un curieux cas de tic," *Journ. de neurologie*, 1899.

The displacement is effected by a moderately brisk muscular contraction that rotates the head to the right on its vertical axis, and succeeding contractions only serve to accentuate the deviation or to maintain it when the head is beginning to revert to its original position. There are none of those upward or downward oscillations, those hesitating, tentative little jerks that some patients make before assuming a fixed torticollic attitude. In L.'s case the duration of the wryneck is exceedingly variable; sometimes the head returns spontaneously to its place, and deviates afresh immediately after, but its periodicity changes with the days, and even with the minutes.

The torticollis is accompanied by a rather disagreeable sensation, a feeling of fatigue in the muscles concerned, of "dragging" in their bellies as well as at their insertions. The site of this sensation is over the left sternomastoid, on the right half of the posterior aspect of the neck, and deep in the right shoulder, whereas the upper parts of the trapezii, the left half of the neck and its anterior surface, and the right sternomastoid, are areas that are free from pain.

Here, further, as in all cases of the same nature, the subjective sensations differ from day to day, and moment to moment. It is just as perplexing to localise these pains exactly as to fix the topoalgia of a neurasthenic. The lack of precision of the answers is no doubt explicable by the variability of the muscular contractions.

Emotion, apprehension, the presence of strangers, tend to intensify the spasm, which tranquillity and rest will attenuate. On the other hand, the most trivial incident—a sudden noise, an unexpected question, the act of swallowing saliva, of putting out the tongue, etc.—will reawaken the latent torticollis; any surprise, any movement, or even the idea of a movement, suffices for its ebullition.

Under the influence of the will, particularly after a time of rest, the head may sometimes reoccupy the mid position spontaneously, a result unfailingly obtained by distraction also, as when the patient is hearkening thoughtfully to her father's conversation. On her "bad days," however, the use of even considerable force fails alike to hinder the head's turning and to effect its replacement. That is to say, the resistance offered by the torticollis to reduction may at one moment be nil, at another, feeble, or forcible, or even insuperable.

Some patients affected with mental torticollis seem to have lost the sense of position of their head, others evince a want of precision and assurance in the execution of different limb movements. Speaking generally, it may be said that downward movements of the arms are less good than upward ones, and that their syn-

chronous and symmetrical action is accomplished with greater ease than is the operation of one only.

The debut of mental torticollis is usually insidious. Whether head or shoulder be implicated first, the incipient motor reaction is infrequent, inconsiderable, and transitory. Little by little its frequency increases and its duration lengthens, till the end of a few months sees the torticollis established.

It may happen that the onset is so stealthy that it eludes the subject's own notice, and attention is called to his peculiar attitude by the members of his circle. Not seldom the earliest localisation of the condition in a particular muscle is abandoned in favour of some other, and resumed at a subsequent stage. Occasionally the torticollis passes from right to left, or vice versâ; occasionally, too, the clonic variety may give way to the tonic after a few weeks or months.

It has been already remarked that at the outset the tic is infrequent, and may depend for its manifestation on certain predetermined circumstances, as, for instance, the exercise of the faculty of writing. Such was the case with S., with P., and with N.

N. was a patient forty-eight years old, with a left torticollis dating back twenty months. His account of its origin was to the following effect: for some years he had been employed in a commercial office, where from seven in the morning to eight at night he was occupied in writing, head and body being turned to the left. At the beginning of 1900, consequent on a succession of troubles, he noticed that his head was twisting round to the left in an exaggerated fashion while he was writing, and the rotation gradually began to assert itself at other times, when he was reading, or eating, or buttoning his boots. Even apart from any other act, the rotatory movement soon became incessant, continuing while he was on his feet, but vanishing completely if he lay down or if the head was supported. At present he has the greatest difficulty in writing, for his head at once deviates violently to the right.

The spasmodic movements sometimes spread to the shoulder, arm, and trunk, and, in one of our cases, to the

leg. Should the condition be advanced, it is frequently complicated by choreiform or athetotic movements in the limbs, or by irregular and arhythmical tremors.

A case of this nature was shown at the Neurological Society of Paris by Marie and Guillain[1]:

The patient, forty-nine years of age, was suffering from muscular spasms that kept turning his head first to one side and then to the other. Fixation of the head between the hands assured a few moments' respite, but the convulsions were quick to reappear. The left hand was constantly being brought up to the face in the endeavour to procure immobility, while the arms were the seat of abrupt jerking movements intermediate between tremor and chorea.

The various reflexes were normal; stimulation of the sole of the foot evoked a flexor response on either side, and no symptom of hysteria was forthcoming. The disease had made its appearance in 1879, when, without discoverable motive, the head had commenced to tremble and to work round to the left. Section of the tendon of the sternomastoid did not impede the development of the affection, which two years ago increased in intensity, when the above-mentioned movements in the arms were superadded. The likelihood seemed to be that they were of the same nature and origin as the torticollis itself.

In reference to this communication, the following remarks were offered by Professor Brissaud:

It is true of all forms of functional hyperkinesis, that the indefinitely prolonged repetition of the same act leads finally not merely to muscular hypertrophy, but to a ceaseless over-activity of contraction in all the muscles affected. That this hypertrophy and hyperexcitability depend on some organic central lesion is not the necessary sequel. A purely functional exasperation may entail visible augmentation of movement, the cause of which is not central, but lies in the external manifestation of muscular over-activity.

The antagonistic gesture is, in some instances, contemporaneous with the wryneck, although more usually it is not in evidence until months or years after the distortion has become inveterate.

[1] PIERRE MARIE AND GUILLAIN, "Torticolis mental avec mouvements des membres supérieurs de nature spasmodique," *Soc. de neur. de Paris*, April 17, 1902.

Mental torticollis is characterised by remarkable chronicity. We have seen cases of ten or fifteen years' duration and more. Temporary remissions have been known, however, and alternations with other tics or with psychical affections. At the Congress of Limoges, the following case was reported by Briand:

As the result of a bicycle accident, a young man developed a torticollis which ordinary treatment was sufficient to cure, and it remained in abeyance until he entered a government school, when its place was taken by a tic of the shoulder, with twitching of the mouth and eye. At the approach of the annual vacation the tic disappeared, and the torticollis, for some simple reason or other, became obvious again. The latter had once more been got under control by the time the holidays were over, but on the patient's re-entering school the shoulder tic again manifested itself, and this sequence recurred several times. A permanent cure was eventually effected, but he continued as psychasthenic as ever.

In another of Briand's cases torticollis alternated with astasia-abasia, a sort of "mental paraplegia." The patient could not walk at all without crutches, or without a little *minerve*, which he used either to steady his gait or to keep his head straight.

No doubt facts such as these just given are rather uncommon, but there is abundant reason for considering mental torticollis one of the most tenacious and intractable of all tics.

### TICS OF THE TRUNK

The rarity of isolated involvement of the thoracic muscles, and the frequency of their inclusion in tics of the neck and limbs, arise from the fact of their insertion into the bones of the extremities, and consequently conditions affecting them will be dealt with in another place. Omitting for the present all reference to the muscles of respiration, we have to consider only the vertebral and abdominal groups. These pass into activity in the rhythmical salutation and balancing movements so common among idiots, movements bear-

ing the most intimate analogies to the tics, though their peculiarity of rhythm justifies their separate classification.

Tonic contractions that find expression in attitude tics of the body are generally associated with tonic tics of the neck and limbs, and in some cases of mental torticollis the deformation they produce is extensive.

The material part played by the abdominal muscles in the function of respiration explains their implication in respiratory tics. A curious case of this kind has been published by Pierre Janet[1]:

A woman thirty-two years old had been afflicted for three years with a respiratory tic that consisted in imitating with the lips the neighing of a horse, and with a still more extraordinary tic of the abdominal parietes. She appeared to "swallow her stomach"; in other words, her abdomen, prominent enough in its ordinary state, was flattened and retracted, and the skin so stretched and dragged upwards that the umbilicus approached the costal margin. Just as it seemed to be disappearing, to be "swallowed," relaxation of the abdomen slowly took place, and this procedure was repeated ten or twelve times a minute. Pressure on the epigastrium inhibited the abdominal movement, but was accompanied by immediate renewal of the neighing, whereas with the relief of the pressure the sequence of events was inverted.

### TICS OF THE ARM AND OF THE SHOULDER

In the upper extremity tics may affect the various muscles of the shoulder, arm, or forearm. Shoulder tics are of frequent occurrence, and often owe their origin to the discomfort of a tight sleeve or of a badly fitting collar. They are generally a concomitant of neck tics, in particular of mental torticollis.

In this connection we may recall the case of O., and supplement it by a description of another—viz. young J.

This boy J. had always been "nervous," and affected with "nervous movements" of face or limbs. At the age of thirteen years, when playing in the house one day, he knocked himself against an open

[1] PIERRE JANET, *Névroses et idées fixes*, vol. i. p. 311.

door and bruised the shoulder near the outer end of the left clavicle. Three or four days later all pain and discolouration had vanished, and the child's movements were perfectly unimpeded again. His tics continued as before.

Two months after this little accident was over and forgotten, it was remarked that at the seat of the contusion there was a slight swelling, quite painless and scarcely even uncomfortable, but disquieting enough to the parents and thought to require applications of neapolitan ointment and the actual cautery. This line of treatment effected no alteration in the local condition, but it had other far-reaching consequences, for the boy noticed the anxious interest aroused by the singular exostosis, and began to devote attention to it himself. From the moment that his parents manifested their apprehension by words of pity and by solicitous examination, his tics developed a preference for the left shoulder, though continuing to exhibit themselves in the face and the right arm. He would unexpectedly elevate or depress his shoulder, would shrug it forwards or brace it back, accompanying the performance with inclination of the head or abduction of the upper extremity. He was very positive as to the painless nature of his affection ; his sole complaint was of a certain stiffness in the joint, and at the thought of it came an impulse to move the shoulder which there was no resisting. The twitching would disappear for a time for no fathomable reason, and reappear again. By the exercise of a little circumspection he could temporarily overcome it, and during sleep it subsided entirely.

The facts—duly controlled and confirmed by the parents—that involuntary shoulder movements preceded not merely the application of the counter-irritants, but the accident itself, and that the unique difference lay in the similarity of his shoulder tic to all his other tics before the trauma, and in its marked preponderance in degree and frequency after, especially subsequent to the treatment, are of weighty diagnostic significance. Plainly the injury and its sequelæ did not exert any causative influence on the tic, and while it is conceivable that the clavicle may have been cracked and an exostosis ensued, we must repeat that the pre-existence of the movements in question negatives the possibility of their being attributable to nerve irritation from a periosteal overgrowth. The only effect which the accident and its consequences had was to intensify the patient's preoccupation and to determine the incidence of the tic.

By the month of October, 1900, the latter was at its height, and had reached a state where differentiation of the movements and of their muscular counterparts was attended with no little difficulty. They could be resolved into four principal groups, whereby the shoulder was raised, lowered, advanced, or drawn back, respectively. The first of these presented no unusual feature except that with it the head was commonly inclined to the same side ; but the act of depression was rather peculiar, inasmuch as it was achieved by a sudden contraction of the inferior

muscles of the scapula, together with the pectoralis, which drew the humeral head downwards, elongated the capsule, and stretched the deltoid fasciculi over it. The space thus left between the separated articular surfaces was partly filled in by the neighbouring ligamentous and muscular structures. Anterior or posterior projection of the shoulder took place at the expense of an actual subluxation, the head of the humerus bulging under the pectoral or the scapular muscles. Each and every movement was accompanied by articular cracking, sometimes so insignificant as scarcely to be pathological, to which, nevertheless, the boy attached extravagant importance and devoted methodical investigation.

Ordinary arm movements were, without exception, unimpaired, nor was any bony malformation discoverable. The two shoulders were practically symmetrical, though the upper border of the trapezius on the left side was, if anything, thickened and more prominent than its fellow, and the same applied to the left scapular muscles. Horizontal extension of the left arm revealed a slight tremulousness, quite distinguishable from pathological tremor and from fibrillary twitching, and wholly comparable to what is seen when, by reason of a fracture or otherwise, a limb is for a certain length of time prevented from executing movements of extension.

[Beating or striking tics (the patient using his own fist against himself) arise from the attempt to alleviate some insignificant pain or irritation; but tics of this kind are in their turn the exciting cause of local discomfort, and so of fresh tics. In spite of the obviousness of this, it is often difficult to convince the patient that his movements are prior, not consecutive, to the unpleasant sensations.[1]]

Finally, tonic tics of the upper extremity find expression in attitudes that vary with the localisation of the contraction. We have already had occasion to observe this, which is an almost constant phenomenon in mental torticollis, in the case of young J., in Madame T., and in N., where, it will be remembered, the all but permanent elevation of the right shoulder seemed traceable to the habit of cutting stuffs with a pair of large scissors.

[1] MEIGE AND FEINDEL, "Remarques cliniques et thérapeutiques sur quelques tics de l'enfance," *Journ. de neurologie*, 1904.

### TICS OF THE HANDS—SCRATCHING TICS

Scratching movements are infinite in their variety, and since the co-operating muscles vary in each case, the question of muscular localisation is of secondary interest.

The object in view in the act of scratching is relief from some such source of cutaneous irritation as a pimple, an abrasion, a burn, the bite of an insect, etc., and so long as the cause persists, the function is being rationally exercised; but to persevere mechanically, involuntarily, immoderately, in the absence of pruritus or of other paræsthesiæ, is a sign that the functional act is growing into a tic. Innumerable tics are thus developed, and they are intimately associated with biting tics.

S. passes his hand every instant over his forehead, O. over his eyes, T. over her lips, P. over his moustache, young J. over his budding whiskers, etc., etc. These elementary tics are scarcely more than stereotyped acts, and may maintain the semblance indefinitely, though there is also the likelihood of their becoming immeasurably more pronounced.

M. scratches his lips with his nails till they are bleeding; E. suffers from a facial tic, and scrapes at his forehead and temples to such an extent that his complexion is perpetually blooming with a crop of little bleeding excoriations; in some places, as a result of ceaseless rubbing and tapping, the skin is thickened and discoloured—a condition that might be known as "scratchers' corns." Madame W. used to tear at her toe nails with her fingers whenever she had retired for the night; and at the present time, as a result of incessantly passing a fine gold chain between the pulp of her fingers and the nails, she has succeeded in half detaching the latter from their bed.

A case reported by Raymond and Janet[1] is one of unusual severity.

A little girl ten years old was covered from head to foot with scabs and sores, some of which on the body were several centimetres in diameter and looked very ugly. These she had contrived to inflict on herself, in spite of every precaution and admonition. It appeared that successive attacks of measles and of whooping-cough at the age of five had entailed long rest in bed, and had been followed by a tardy convalescence, in the course of which the development of a few pimples on the forehead was the signal for her to commence scratching them and any other part of her body where there was the least discomfort, or where the skin was at all roughened. This merciless self-mutilation ended in the production of large and painful excoriated areas; nevertheless a tic had sprung from the habit, and it remained inveterate.

Another analogous case is quoted by the same observers[2]:

In this instance, apart from the obvious existence of a confirmed tic, the patient had a curious look about the eyes which a nearer glance showed was caused by complete absence of the eyelashes. He had a trick when speaking or talking of lifting his right hand and running his finger carefully along the margin of the lids, and if it encountered an eyelash projecting beyond the skin, he promptly plucked it out. The endless repetition of this toilette rendered the eyelids barren of lashes.

### TICS AND WRITING

Are writing tics to be recognised?

Tricks and turns of writing, however ridiculous, involuntary, and ingrained they be, scarcely deserve to be called tics. Those flourishes and ornaments that some people take delight in adding to their letters can no more be considered the expression of a pathological state than the superabundant gestures, the redundant words, the exuberant mimicry, of which others are so prodigal. They are simply modes of exteriorisation peculiar to the individual, and if in their superfluity

[1] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 390.
[2] *Id.*, *loc. cit.* p. 388.

and excess they go beyond the strict requirements of the case, still, they are only mannerisms of writing or of speech. Their manifestation is rigorously dependent on the performance of some function, and is not preceded by an imperious need of execution.

More akin to the tics is stereotypy of written language, so common an appanage of mental disease. The term is intended to include such habits as repetition of a particular formula, underlining of words, constant use of hyphens in the same way, writing of certain pages in a hand differing from the rest of the manuscript. Séglas[1] has done excellent work in the analysis and interpretation of these troubles. One of his patients used every week to write letters bearing the same complicated address, and signed invariably with the following rigmarole:

> De Senez de Mesange, great Prince Napoleon, great Prince of the Blood Royal and Imperial of the Universe, great Admiral, great Marshal of my armies, . . . great Procurator of the Republic, Royal and Imperial, great President of the Republic, Royal and Imperial, great Pope, great Duke, great King, great Emperor—Jupiter, Louis XIV. and Louis XV.

Another would write after almost every sentence:

> *Dieu et son droit*, let him be cursed in all that is most cursed *qui mal y pense*.

This was a sort of exorcism, a cabalistic formula enabling the persecuted unfortunate to defend herself against the wiles of the evil spirit.

A tic of writing, however, is of a totally different nature. He who, without pen or pencil, is constrained by irrepressible impulse to go through the movements of writing with his fingers, convulsively, impetuously; and he who, without rhyme or reason, feverishly traces characters utterly at variance with the ideas he would

[1] SÉGLAS, *Les troubles de langage chez les aliénés*, Paris, 1892.

express, are alike subjects of a writing tic. Of the former, we know no characteristic example, while in the latter case the study of the phenomenon would lead us too far into the realm of automatic writing and graphic impulsions. We must content ourselves with recalling its occurrence in an undeveloped form in the case of O.

Among those who are affected with tics, disorders of writing are very infrequent, even where the tic's exhibition is displayed in the upper extremities. One of the distinctive features of tics, in fact, is the brevity of the interruption they cause in the performance of any voluntary act on the part of the patient. Tics of arm or hand effect but little modification of his writing. He is rarely taken aback by his tic's convulsive demonstration. He can permit the co-existence, on a perfect understanding, of two automatic acts, normal and abnormal, writing and tic.

One of Guinon's patients was wont to proceed in the following way: if asked to write, he would lean on the table, pick up his pen, and just as it was about to touch the paper, make several little movements of circumduction with his right hand, as a child does. Thereafter, he would sometimes pass on at once to trace the letters; at other times he would have to grind his teeth, contort the right half of his face, put out his tongue, pucker his nose, or dip his pen spasmodically into the ink ten consecutive times—ejaculating ahem! ahem! the while—before being able to commence. He would often cease altogether, to make one or two grimaces, or to wave his hand about. As far as the actual writing was concerned, its distinctness and evenness were no less praiseworthy than its style and content, and though a glance at his gesticulations led one to expect blots and irregularities in his manuscript, he conducted his task with assurance and correctness.

Of course, if the tic, whatever it be, exceed a certain limit of frequency and violence, accurate writing may amount almost to a physical impossibility, in which case the patient usually discontinues, although if called on to exercise his will he can always pen a few words

and even a few lines. However this may be, the spots and scrawls and zigzags and shaky cramped characters we associate with such organic affections as tabes, Friedreich's disease, paralysis agitans, etc., are wholly exceptional in the case of tic.

While, then, disturbances of the function of writing are seldom ascertainable in those who tic, we have convinced ourselves on more than one occasion of the truth of the converse, that the exercise of the faculty is sometimes intimately combined with the evolution of tics of neck and shoulder.

S. dated his mental torticollis from the time when he used to copy figures for several hours a day. As a matter of fact, he wrote an excellent hand, and experienced no difficulty in performing the necessary movements, but continued writing increased the rotation. N.'s torticollis was the sequel to long spells of office work, during which he never laid down his pen. In the case of L., the wryneck and the convulsions of the right arm were preceded by a sort of writers' cramp of the right hand, and subsequently of the left.

In the accompanying instance, the development of which one of us has had the opportunity of observing, the appearance of the torticollis was at first confined to occasions of writing, but gradually it came into evidence with other arm actions, and eventually established itself in a permanent fashion.

P., fifty years old, occupies a responsible position in a big railway company, is director in a large office, and performs his duties with peculiar conscientiousness and zeal. Naturally an emotional man, he was much distressed by an unusually sad family bereavement about the middle of 1900, which coincided with a period of great overwork. As he was obliged every day to arrange innumerable papers and affix his signature to them, he began to notice that each time he wrote his name his head turned to the right involuntarily, and he felt a sensation of discomfort in the neck and right shoulder. He tried to remedy the faulty position by holding his chin with his left hand; nevertheless, in the

course of the next few months the movement began to assert itself not merely as he wrote his signature, but also when he cut his food at table, or sharpened a pencil, or trimmed his finger nails.

*October* 14, 1901.—Whenever P. proceeds to write, his head is immediately rotated to the right and maintained in that attitude by successive contractions. Simultaneously, the right side of the face is distorted by a grimace, the right eye blinks, and the right corner of the mouth is drawn down by a strong effort of the platysma. The state of affairs is unaltered so long as he is handling a pen, though, curiously enough, his caligraphy itself is flawless. The more firmly he grasps his pen, the more violent the spasms; the substitution of a pencil abates them somewhat, as does writing on the floor with a cane, while if he traces letters in the air in front of him with his finger, they do not occur at all. When both hands are occupied in writing, the head still turns to the right.

He was advised to incline his head on his right shoulder as he wrote, and to force his right sternomastoid to contract, in carrying out which instructions he managed to form several hooks and rods correctly without any torticollic movement, and was both elated at the success of the experiment and dejected by the thought of his infirmity. Accordingly all writing was prohibited, all signature making reduced to a minimum, and he was recommended a simple pencil exercise, to be performed with slowness and deliberation while the head was kept in the position just mentioned. Identical rules were to be observed when eating, etc., and a tepid bath was prescribed night and morning.

*October* 21.—Some improvement has taken place. The patient is less uneasy and less discouraged. Dissociation of the movements of writing into their component parts and isolated execution of each are accomplished admirably at the first trial, less well the second, and at the third, rotation recommences. Fatigue rapidly increases, and P. sinks again into impatience, enervation, and despair. Occasionally his anguish is so extreme he is covered with perspiration even after the most elementary pencil drill, and is forced to mop his brows.

*November* 21.—Improvement is maintained. He can now write various letters and short words at his ease, though he still feels uncomfortable in anything requiring a more sustained effort. Otherwise, he is conscious of greater control over his head.

*December* 15.—The amelioration has not persisted. While he was paying a visit to the barber's, and having his hair cut, rotation to the right began again, and when lifting his hat in the street to salute a friend, he repeated the movement. At table, too, he noticed it as he was in the act of bringing his glass to his mouth. P. is consequently upset, and often plunged into tears.

*December* 24.—The patient's condition is more than ever deplorable. On the slightest provocation—indeed, on no provocation at all—furious torsion movements force the head backwards and to the right, while the right shoulder rises.

Complete rest in bed was ordered, yet after two or three days of this repose the torticollis manifested itself even in the recumbent position. As a result, he was quite unnerved and talked of suicide. Another physician called in consultation agreed with what had been done, confirmed the integrity of all the reflexes, including the plantars, and recommended a course of electricity.

*January* 20, 1902.—There has been no further change. P. stays abed all morning, inventing endless arrangements of pillows and dictionaries to prop his head. When he goes out for a walk, he turns up the collar of his coat and leans his head on the point of it.

*January* 27.—The electrical treatment has been relinquished. He has also taken one douche at a hydrotherapeutic establishment, but expressed his dissatisfaction and vowed never to return. He then departed to undergo a "water cure" in the country, since when he has vanished entirely from observation.

More than once we have had occasion to notice that the degree and extent of such neck and arm convulsions as are provoked or exaggerated by the act of writing vary with the level at which the patient has to write. With elevation of the arm the movements are weak and easily mastered; conversely, lowering of the arm augments them in a marked manner. We repeat, however, that in all these cases the handwriting itself is not interfered with.

It is quite otherwise with writers' cramp, the so-called "graphospasm" or "mogigraphia." This condition is purely and exclusively a disorder of the function of writing, depending for its exhibition on the exercise of this function, else is its existence concealed. For this reason it ought to be differentiated from the tics, although, by its development in obvious neuropathic or psychopathic subjects, it is closely linked to them.

One of Oppenheim's cases was a lady whose husband suffered from paralysis agitans; in her case, fear

of becoming affected with the same disease led to the development of writers' cramp. Sometimes it occurs in families, and it may be a concomitant of genuine tics. In spite of the affinity between these two sorts of functional disturbance, we do not feel it incumbent on us to enter on a detailed study of scriveners' palsy in this place.

### TICS OF THE LOWER EXTREMITIES—WALKING AND LEAPING TICS

Tics of the lower limbs are infrequent, and seldom isolated. One of the most habitual of these is the "kicking tic." Sometimes one leg knocks against the other, as in O.'s case, or it is kicked out in front, or to the side, or even backwards, after the manner of a horse. Tonic convulsions of the leg muscles have been observed to give rise to phenomena analogous to tonic tics. Tonic contractions restricted to a particular muscle, or group of muscles, and accompanied by relaxation of the antagonists, have been christened by Ehret[1] "habit contractures" and "habit paralyses." Their characteristic feature is the fact of the contracture being voluntary in origin. For instance, an individual wounds the inner margin of his foot, and learns to escape the pain by throwing his weight on the outer side. Voluntary contraction of the adductors of the foot passes gradually into an involuntary stage, giving place to spasmodic contraction, and the simultaneous inactivity of the antagonists—in this case the peronei—leads ultimately to their atrophy.

In Ehret's view the fact of loss of volitional control argues the psychical nature of the affection, and a similar opinion is held by Thiem, Jacoby, and Wolff, who attribute the analogous cases they report to a sort of traumatic neurosis in which the psychical

[1] EHRET, *Archiv f. Unfallheilkunde*, 1898, p. 32.

element is preponderant. Needless to remark, the patients in question were not suffering from hysteria.

In this connection ought to be recalled the cases described by Raymond and Janet[1] under the title of "tics of the foot."

The first was a woman thirty-seven years old, who as she walked used slightly to invert her left foot, forcibly dorsiflex the great toe, and separate the remaining toes widely one from the other. Notwithstanding its painful nature, the condition had persisted for seven years, and had originated in a very interesting way. She happened to be undergoing a course of mercurial inunction at the same time as she was troubled with a corn. The idea struck her that perhaps the application of the ointment to the corn might prove efficacious, but while trimming the latter some days later, she had the misfortune to cut herself. Dread of the possible evil effects of the injury was followed on the morrow by an accession of cramps in the foot, the continuance of which led to the deformity that ever since had made walking a misery.

The other patient was a young man twenty years of age, whose gait used to be arrested, after a walk of ten minutes, by sudden and vigorous plantar flexion of his right toes. Momentary repose sufficed to make the spasm disappear, but it constantly recurred.

Re-education and psychotherapy effected a cure in each instance, so that their psychical nature cannot be called in question, nevertheless the painful character of the affections must not be forgotten, and since the occasions of their manifestation were confined to the act of walking, they correspond rather to "functional" or "professional cramps." In any case, they cannot be confounded with the painful cramps of the calf muscles that characterise certain toxæmias and infections (alcoholism, cholera, etc.).

On the other hand, there can be no doubt of the existence of definite tics of walking—widely varying functional derangements of tonic or clonic type, distinguished by the unexpected interruption of ambulatory rhythm.

[1] RAYMOND AND JANET, "Note sur deux tics de pied," *Nouv. icon. de la Salpêtrière*, 1899, p. 353.

We have met with a patient (says Guinon) who would abruptly halt and bend his knees as though he had just received a violent blow on the hock for which he was unprepared. To see him, one would have thought he was about to sink to the ground.

Such tics of genuflexion are not particularly uncommon. Oddo [1] has recently recorded a very instructive example, whose pathogeny he has been at pains to elucidate.

A little girl, Th., ten years of age, takes four or five perfectly normal paces when she starts to walk, then bends down quickly to the right, flexing her knee to an acute angle and inclining her trunk forward with the deflection of her pelvis, just as a child whose genuflexion in front of an altar has become mechanical by repetition. The performance is sometimes so altogether sudden that Th. actually falls on to her right side. One striking feature of the case is that if she makes a tour of the room in order to be observed at leisure, the inclination never fails to occur at exactly the same point in the circuit—namely, when she is opposite the observer. It is useless formally to interdict her from this routine, for before one has time to notice any irregularity in the gait her knee suddenly flexes at the bidding of an invincible impulse, and a moment later, without any deviation from her path, she has resumed her rhythmical step round the apartment.

This movement is not her only one, however. While she lies in bed she can, by flexing her thigh on her pelvis, crack her joints loud enough to be heard, and when she has been up a little while the same action is exhibited. The absence of these cracking sounds during ordinary walking, and their occurrence in the act of genuflexion, very properly explain, as Oddo thinks, the origin of the tic. It seems that the articulations at hip and knee on the right side were affected as the result of successive attacks of scarlatina and diphtheria two years ago, which necessitated a prolonged sojourn in bed, and were accompanied with severe pain. It is interesting to note that the tic made its appearance only after the latter had considerably subsided.

Raymond and Janet [2] have reported the case of a young woman who fell on her knees every few paces, rising again with facility and taking a few more steps, to come down on her knees once more with a loud noise. She never did herself any harm, however, and for that matter the accident never occurred on a staircase or in a unsuitable or dangerous spot.

[1] ODDO, "Tic de la génuflexion," *Marseille médical*, March 15 1902.

[2] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 391.

Leaping tics are met with also.

Sometimes when walking, but more usually when standing quietly, according to Guinon, the patients make little jumps or leaps in their place, looking rather as if they were dancing than really springing into the air. Some actually bound along, others run for a yard or two.

Still more bizarre and complex tics have been described, in particular by Gilles de la Tourette. One patient used to commence to run, then kneel suddenly, then rise with equal abruptness. Another was in the habit of stooping down, as if to pick something off the ground, and smartly rising again.

The kinship of these and other similar conditions to the tics is undeniable, and such seems to be the case with the yet more extraordinary phenomena of *jumping* in Maine (Beard), *latah* among the Malays (O'Brien), *myriachit* in Siberia (Hammond). All these affections show, among others, this peculiarity—that unexpected contact produces a spring (Guinon).

In a recent thesis Ramisiray has depicted the dancing mania (*ramaneniana*) of Madagascar, a condition allied to the latah of the Dutch Indies, but more intimately connected with hysteria, perhaps, and with the saltatory choreas, the saltatory cramps of Bamberger, St. John's and St. Guy's dance, tarentism, etc. The exact nature of these convulsive disorders is still *sub judice*, but in any case they present more than a mere resemblance to the tics.

### SPITTING, SWALLOWING, AND VOMITING TICS—TICS OF ERUCTATION AND OF WIND SUCKING

In some tics the palatal muscles are found to contract, but this contraction must not be confused with the spasmodic twitches of the same muscles associated with facial spasm and due to central or

peripheral irritation of the seventh nerve. One of us has had occasion to observe an excellent case in point in a young man afflicted with spasm of the orbicularis and zygomatics on the right side, in whom synchronous displacement of the uvula occurred with each twitch. The extreme abruptness and rapidity of the muscular discharges, the inadequacy of voluntary effort to check them, the absolute uselessness of prolonged and systematic treatment, left no doubt as to the accuracy of the diagnosis.

The occurrence of palatal spasm in intracranial lesions has, of course, been recognised—in cerebellar tumour (Oppenheim), in epidemic cerebrospinal meningitis, in aneurism of the vertebral artery (Siemerling and Oppenheim). It is occasionally associated with the emission of clucking sounds, and with convulsive action of hyoid and tongue muscles. In such cases the distinction between a tic and a spasm is not always easy to establish. We may, however, readily recognise that we are dealing with the former if the contractions of tongue, palate, and larynx are contemporaneous with the execution of a functional act, such as expectoration.

Among those who labour under obsessions, tics of expectoration are well known. One of Guinon's patients, while making forced expirations, used to bring his hand up over his mouth convulsively as though he were afraid of spitting on some one in his neighbourhood.

A case of Séglas', from whom stigmata of hysteria were absent, was possessed, among other things, with the fear of having swallowed certain objects, such as pins, knives, etc. The obsession eventually became so vivid and so intense at certain moments, that it began to be accompanied with a sensation as of a foreign body arrested in the œsophagus, and the anguish thus created revealed itself by various reactions, one of which consisted in excessive salivation and ceaseless expectoration, entailing the carrying about and use of numbers of handkerchiefs.

It is scarcely possible for the mechanism of deglutition, the orderly succession of muscular contractions, to be interfered with by the will, but increased frequency of these movements may constitute an abnormality. Hartenberg's[1] case of deglutition tic was characterised by a continual desire of swallowing saliva; the patient, it is true, was an hysteric.

Rossolimo[2] has called attention to what he distinguishes as amyotaxic troubles of deglutition, a dysphagia of which three types, motor, sensory, and psychic, may be specified. Cases of the last form had already been described by Bechterew.[3] The patient either suffers from a genuine obsession, or is ever at the mercy of an involuntary or even an unconscious dread of choking as he eats, a dread with which he is powerless to cope, though in the case of others the phobia and the dysphagia may alike be intermittent. In the majority of instances there are grave hereditary or personal neuropathic antecedents.

Some people are afflicted with eructations so continual that they amount to tics. One of us is acquainted with a family several of whose members present this peculiarity in different degrees, yet none of them suffers from hysteria.

Otto Lerch[4] has published a case of multiple tics, among which may be enumerated opening and closing the eyes, rolling of the ocular globes, tilting back of the head, with instantaneous recovery of position, inclination of the whole trunk to right or left—each and all of which movements are frequently attended,

[1] HARTENBERG, "Tic de déglutition chez un hystérique," *Rev. de psychologie*, 1899, p. 175.

[2] ROSSOLIMO, "Ueber Dysphagia amyotactica," *Neurolog. Centralb.* 1901, Nos. 4, 5, 6.

[3] BECHTEREW, "Ueber die psychischen Schluckstörungen," *Neurolog. Centralb.* 1901, p. 642.

[4] LERCH, "Convulsive Tics," *American Medicine*, Nov. 2, 1901.

especially at night and in the morning, by profound eructations.

Of course, the prominent place occupied by these signs in hysteria is well recognised: the demonologues of old regarded them as an index of the departure of the devils that dwelt in the possessed. In a case of hysteria that came under the notice of Raymond and Janet,[1] a general tremulousness of the whole body was replaced by a chorea of the right arm, which in its turn was succeeded by the perpetual emission of sonorous eructations. In another instance[2] inspiratory hiccoughs and expiratory eructations co-existed. A similar example is cited by Cruchet in his thesis.

In the same category of facts are included those to which the name of *aerophagic tic* has been applied. Various cases have been narrated by Pitres and by Séglas,[3] the latter of whom, in a remarkably complete analysis of the condition, has demonstrated its identity with the tics, and written very instructive commentaries on his observations.

I was consulted (says Séglas) by a man thirty-four years of age, who was sent to me as a hypochondriacal neurasthenic. No sooner had he entered my consulting-room than I was astonished to find he was giving vent to repeated sonorous eructations at very brief intervals. His story was to the effect that several weeks previously he had been suddenly seized in the middle of a meal by a sort of vertigo, and had lost consciousness. A consideration of subsequent events made it more than probable that he had had an ictus; the patient, however, was for no apparent reason persuaded that he had been poisoned by badly cooked food, and from that moment became despondently preoccupied with the state of his stomach. A few days later the eructations made their appearance.

A closer examination very soon dispelled the idea of their gastric origin, seeing that the digestive functions were in every respect normal, whereas the symptom in question occurred at any moment, independently

[1] RAYMOND AND JANET, *loc. cit.* vol. ii. p. 35.

[2] *Ibid.* p. 357.

[3] SÉGLAS, "Paralysie générale et tic aérophagique," *Semaine médicale*, 1899, p. 9.

of the stage of digestion, and the gases evolved were absolutely inodorous. On the other hand, one could easily satisfy oneself that the eructations were preceded by an inspiratory effort and by two or three very obvious movements of deglutition, accompanied by a low, rumbling, pharyngeal noise, and followed almost immediately by the expulsion of gas. Their reproduction several times a minute was spasmodic in character and irregular in rhythm, and continued, it might be, for hours.

Of this series of phenomena the patient had conscious knowledge only of the last—viz. the eructations—and affirmed their involuntary nature and his desire to be rid of them.

The influence exerted on them by various circumstances is worthy of notice. Any emotion, or any reference on the part of the patient to the condition of his stomach, tended to exaggerate them, while, inversely, it was remarked by his wife that the distraction of conversation, or of a promenade, or of musical séances—to which he was passionately devoted—served to banish them instantaneously and for as long as the distraction endured. Sleep suspended their activity, but at any interruption of it they scarcely ever failed to reassert themselves.

These considerations determined my view of his trouble as a peculiar form of tic, which consisted in "muscular spasms systematically harmonised to produce the alternating deglutition and expulsion of a certain quantity of atmospheric air" (Pitres), which therefore might be denominated an *aerophagic tic*.

Different varieties of this tic exist, according as the air swallowed is derived from the exterior or from the lung, and depending on its penetration into the stomach or simply into the pharyngo-œsophageal canal; and further, the physiological mechanism of the condition varies with them.

Let us suppose that the swallowed air comes from the lung. In this case, a certain quantity of air is imprisoned at the beginning of expiration in the pharyngo-œsophageal cavity, whose orifices are firmly closed by simultaneous contraction of the muscles of the palate, glottis, and base of the tongue. At this moment a brisk contraction of the constrictors of the pharynx drives the accumulated air out by the mouth, setting the membranes surrounding the supero-anterior opening of the cavity into vibration in so doing, whereby the air escapes as a more or less noisy eructation.

Should the mouth not open at this juncture, however, the air is compressed and crowded back into the lower part of the œsophagus, whence it passes through the easily dilatable cardiac ring into the stomach,

to be expelled again by the mouth in the same noisy way once it has accumulated in sufficient quantity.

The deglutition of external air is preceded by an aspiratory thoracic effort ; closure of the glottis forces the œsophagus to open under the stress of increased negative intrathoracic pressure, and to suck air down. When aspiration ceases, this air is either driven out forthwith, or gathered in the stomach, as we have just seen.

One may sometimes notice that the act of suction is succeeded by movements of swallowing, in which case the probability is that at the moment of aspiration the closure both of glottis and of pharynx prevents the penetration of atmospheric air into either the trachea or the gullet, in spite of the differences of pressure, and that these movements allow its passage through the œsophagus.

Aerophagia is by no means, therefore, a simple involuntary movement, but a combination of systematised muscular actions. In fact, it is a tic, and as such has both a physical and a psychical side.

From the material point of view (to quote Séglas again), the predominant symptom is the eructation, and the object in determining the accessory symptoms is to distinguish it from gastric eructations properly so called, the consequence of improper fermentation. In our case the appetite is good, and the digestion normal—tympanites, splashing, and abdominal pain are all absent. The gases evolved are inodorous, and their analysis in different cases (Ponsgen, Hoppe-Seyler, Pitres, Sabrazès and Rivière) has shown that so far from containing any abnormal constituent, they have almost the same composition as atmospheric air. Application of the ear to the vertebral column at the level of the stomach enables one to detect a noise that appears to correspond to the passage of air into that viscus, and less than a second later comes the eructation.

Facts of another kind indicate the participation of a psychical element. The activity of the tic increases under the influence of the emotions and decreases or disappears momentarily at the bidding of the will. Distraction, concentration of the attention on some particular thing, speaking, reading aloud, are also calculated to suspend its manifestations. In some cases, especially where there is an association with hysteria, support is given to the theory of its psychical origin by the observation that prolonged opening of the mouth, and the administration of mica panis pills or of distilled water tinted with methylene blue, have had a definite effect in controlling the spasm (Pitres). Moreover, the co-existence or pre-existence of intellectual troubles or mental peculiarities is often incontrovertibly proved by a painstaking psychological examination.

In reality this aerophagic tic is a symptom-complex encountered in

very different pathological conditions. No doubt its frequency is greatest and its development highest in hysteria, but we are in error if we suppose that it is the exclusive appurtenance of that disease: its occurrence in our case of general paralysis is evidence to the contrary. I have noted it where there was not the slightest suspicion of hysterical antecedents. Nevertheless its relation to pathological mental states of some form or another is invariable.

### It is often found in cases of insanity of the obsessional or of some other type.

I have had an opportunity (says Séglas) of observing an instance of aerophagia in a woman of fifty-four years, who for the last fifteen years has been suffering from hypochondriasis in a delusional form. She believes she has a hole in her head, and that her brain is gangrenous; she is no longer conscious of her body, nor of her food as it passes through. "It is like a cupboard empty of everything but air." Grafted on this delusion is an aerophagic tic, upon which the patient relies in support of her contentions. So little is she able to withstand its ceaseless repetition that the sequence of muscular actions continues though the tongue be held outside the mouth or fixed with a spoon.

I have seen the same phenomenon in another woman, forty-six years of age, afflicted with fixed and systematised delusions of persecution. She imagined that she was being pursued by sorcerers, who had cast a spell on her and were about to poison her, torture her, break her on the wheel, etc. In addition to very distinct and frequent verbal hallucinations and disorders of general sensibility, she exhibited several tics, one of which consisted in spasmodically closing her eyes, brandishing her right arm, and uttering a string of incomprehensible words; the other was this aerophagic tic, characterised by a jumble of quick swallowing movements, pharyngeal grunts, and long-drawn-out, sonorous eructations. All this performance was rehearsed two or three times a minute as a sort of convulsive discharge, which she alleged the sorcerers forced her to emit in spite of herself, exactly as they coerced her into uttering a jargon she did not understand, and wagged her tongue at their own sweet will.

### To quote Séglas again in conclusion:

The air-swallowing tic is merely a syndrome common to various pathological conditions differing widely enough, but all alike in being associated with some degree of mental impairment, in which perhaps may be discovered the actual cause of the condition. It cannot therefore be looked upon as a simple spasm, based anatomically on a reflex arc, but must be regarded as a reaction whose substratum is a cortico-spinal anastomosis—that is to say, it is a tic.

Tics of vomiting may be produced if the diaphragm be affected. Noguès and Sirol[1] have reported the case of a woman with a pharyngo-laryngeal derangement resembling vomiting, except as far as the actual ejection of alimentary matters was concerned. She used to become conscious of a sensation of constriction, and to feel the tickling of a foreign body in the gullet; at this point the slightest pressure on the neck provoked a convulsive attack, in which all the pantomime of vomiting was gone through without the actual emesis taking place.

It is possible, as Noguès and Sirol think, that the trouble may have originated in a reflex spasm, and that with the disappearance of the primary irritation a new psychical factor operated to effect its repetition and prolongation.

The designation of all these functional disorders as tics is not always justifiable, and their separation from the corresponding normal act is frequently a task of delicate diagnosis, but patient search for the exciting cause and study of the concomitant mental anomalies will supply the necessary indications.

### TICS OF RESPIRATION—SNORING, SNIFFING, BLOWING, WHISTLING, COUGHING, SOBBING, AND HICCOUGHING TICS

Respiratory tics are exceedingly numerous. They concern the diaphragm and the muscles of inspiration or expiration, and are accompanied by synergic movements of the muscles of the nose, lips, tongue, palate, pharynx, as well as by laryngeal noises or by tics of the face and limbs. They embody disturbances of various functional acts, and may be subdivided into inspiratory and expiratory tics.

[1] NOGUÈS AND SIROL, *Arch. méd. de Toulouse*, June 1, 1898.

It is only as regards their frequency that such reflex mechanisms as yawning and sneezing are liable to be modified by the intervention of the will. Saenger[1] records the case of a woman twenty-nine years old, not affected with hysteria, who used to suffer from attacks of yawning and of stiffness in the arms, followed by rapid contractions of the tongue lasting for about a minute. He describes the condition as one of "idiopathic spasm" —probably a species of tic. It is in hysteria, however, that functional variations in sneezing and yawning are most commonly found, and the latter, moreover, may constitute the aura of an epileptic fit. Yawning occurs in a most intractable form in meningeal affections, and in cerebral and cerebellar tumours.

"Rhincho-spasm," a snoring tic, has been observed by Oppenheim in a case of neurofibromatosis. In certain tics of this nature, and in sniffing tics, the onset is sometimes attributable to the presence of adenoids.

Among various expiratory tics may be enumerated the habit of blowing through one's nose or mouth. Schapiro has reported a case of expiratory "spasm" due to contraction of the buccinators. Whistling ought to be considered a stereotyped act, rather than a tic, as Letulle maintains.

Spasmodic troubles of respiration, defined indifferently as "spasmodic dyspnœa," "spasmodic asthma," "spasmodic cough," "asphyxial spasm," "nervous cough," etc., ought not to be classified as tics; in many cases they are genuine spasms, arising from some irritation in sensory paths. At the instant of any contact, or under the influence of a sudden noise or a bright light, a patient of Edel's used to become distressingly dyspnœic. Evidently the condition was one of spasm.

Coughing tics also are of remarkably common

[1] SAENGER, *Monatsch. f. Pysch. u. Neur.* 1900, p. 77.

occurrence. Many individuals ceaselessly interrupt the thread of their conversation to make more or less audible explosive expirations, for which there is neither reason nor necessity, since the respiratory paths are free from all irritation or obstruction. These useless little coughs do not always deserve the appellation of tics; in many instances they are mannerisms comparable to the gestures of conversation or reflection, although in some people their insistence, abruptness, and irresistibility might justify their incorporation in the other category. Their co-existence with tics of face and limbs has been noted, as in a case published by Tissié[1] of an eight-year-old child, with ocular and facial tic and spasmodic cough.

Clonic contraction of the diaphragm gives rise to conditions imitated or caricatured by the tics, in particular sobbing and hiccoughing. It must not, of course, be forgotten that these are apt to occur in hysteria, as well as in organic disease of the nervous system, and in grave infectious states. Careful and searching inquiry must therefore precede any expression of diagnosis.

Tonic diaphragmatic contraction is of very much greater rarity. In such cases abdominal respiration comes to a momentary standstill, whereas thoracic respiration is accelerated. The patient is in imminent danger of being asphyxiated, and the insertions of the diaphragm sometimes become painful. What is known as acute pulmonary eructation is occasionally the sequel to this convulsive affection. Tonic contraction of the diaphragm is nearly always of an hysterical nature, and is doubtless akin to the aerophagic type.

[1] Tissié, "Tic oculaire," etc., *Journ. de méd. de Bordeaux*, July 9, 1899.

## CHAPTER X

### TICS OF SPEECH

IN movements of inspiration or of expiration the passage of air through a more or less contracted glottis gives rise to all sorts of sounds, some of which, under certain conditions, must be included in the category of tics.

The most elementary of these, and at the same time the most common (says Guinon), is the involuntary exclamation. In the midst of his tics and grimaces, a cry—ah !—escapes the patient's lips at intervals, a shrill, sudden, and momentary cry which interrupts his talk, or breaks in on a period of silence, and which he repeats only once or perhaps several times in succession. The thread of his conversation, nevertheless, is seldom if ever discontinuous, and his audience is witness of its rationality and accuracy of expression. Rather more complicated is the ejaculation "ouah !" Sometimes one meets with noises that are faithful reproductions of the sounds emitted by various animals.

Guinon is disposed to exclude such simple involuntary explosions as "ahem! ahem!" from the tics, though he admits the analogy to them. He says the sound exactly resembles the trifling little clearance of the throat which is repeated a thousand times a day by people suffering from chronic angina. We, however, are inclined to look upon it as an ordinary spasmodic reaction evoked by some laryngeal or pharyngeal irritation, which in spite of the removal of the latter continues to take place, and because of its meaningless repetition is fairly to be classed as a tic. All that we have said of blinking, for instance, is applicable in this connection.

Of course the embellishment of one's discourse with

more or less audible expirations is of frequent occurrence: the hesitating eh . . . eh . . . to which children give vent in the recitation of their lessons is not confined to them alone. It can scarcely be maintained that these laryngeal noises are tics, since their production is coincident with the exercise of the faculty of speech; hence they are not unlike "functional cramps." On the other hand, the unexpected bark or gurgle that breaks the silence is a pure tic of phonation.[1] Those who suffer in this way reveal characteristic stigmata in the immediateness of the compelling idea and the exaggerated nature of the subsequent satisfaction. To unravel the intricacies of the origin of these tics is a matter of considerable difficulty, though probably imitation is not without influence in their genesis. Reference will be made later to a tic of this kind attributed by Charcot to imitation.

Among the insane similar cries are often the outcome of delusions. At the Congress of Limoges a case was reported by Briand of an old man who imagined himself transformed into a clock and swung his arms with pendulum-like regularity, indicating the hours by uttering raucous sounds at the proper intervals. However curious these sounds were, the fact of their being appropriate is decisive against their classification as tics.

Unmistakable tics of speech, however, do occur.

Speech is a complex of different muscular acts, and, being so, is liable to be disarranged in various ways, by defect in respiration, phonation, articulation, even in ideation. Organic affections aside, it is inadmissible to describe as tics each and all of the functional disturbances of speech that are not based on any discoverable material lesion of nerve centres. One must in fact distinguish between troubles of speech

[1] CHARCOT, *Leçons du mardi*, January 24, 1888.

confined to occasions when the faculty is in operation and those that consist in not merely useless but inopportune utterance. However arduous it may occasionally be to draw this distinction, however common the occurrence of transitional forms, it has the advantage of limiting the scope of the term "tic of language." To the latter category only can the description be applied.

For this reason we think it preferable to exclude stammering, stuttering, and all defects of phonation or articulation whose existence is revealed only in the act of speaking. At the same time reference must be made to facts linking these functional anomalies to the tics, and to instances of the latter existing with or succeeding the former.

Such is the case with stammering.

According to Letulle,[1] stammering is a tic of speech whose beginning is a functional disturbance of nervous centres, as is that of tics in general. Holding as we do, however, that one of the features of tic is its appearance in season and out of season, we cannot class stammering as a tic, since its exhibition is restricted to the exercise of a certain function, viz. speech. It is therefore comparable to a "professional cramp," and we may briefly note the analogies it offers to the tics.

Stammering,[2] which in more than fifty per cent. of cases is hereditary, and associated with a neuropathic diathesis, usually betrays itself in childhood and becomes aggravated at puberty. The old idea which credited stammerers with exceptional intellectual powers, in whom, however, rapidity of thought surpassed rapidity of action on the part of the muscles of articulation,

[1] LETULLE, "Un cas de bégaiement compliqué de tics coordinés multiples," *Gazette méd. de Paris*, 1883, p. 536.

[2] OLIVIER, "Le bégaiement dans la littérature médicale," *La parole*, No. 10, 1899.

is exploded, and to-day those thus afflicted are assigned their true place among the volitionally infirm. In a few rare cases stammering has been due to organic disease of the centres for articulate speech, or of bulbo-pontine nuclei; it has been supposed also to result from genuine spasm on a reflex arc, and this is a possible explanation; as a general rule, however, the pathogeny of stammering is identical with that of tic. Its dependence on such affections of nose, larynx, and pharynx as hypertrophic rhinitis and adenoids has been emphasised by Biaggi[1]; and Derevoge,[2] in directing attention to the association of volitional enfeeblement with respiratory troubles, remarks that stammerers sometimes have a phobia for certain words. Many observers have been convinced of the psychical nature of the affection from the fact of its disappearance during singing, as well as from the effect anger, elation, and other stimuli have in momentarily inhibiting it. The same is of course true of the tics.

Further, little attempt is made either by the *tiqueur* or the stammerer to correct his failing, so that prognosis improves with the adoption of systematic treatment. Stammering is a functional anomaly; it is a derangement of respiration, phonation, and articulation. However normal be the movements of lips and throat in the execution of certain acts, they are far from being normal in the exercise of speech. As a preliminary to speaking the stammerer clenches his teeth and approximates his lips, thus effectually preventing the inrush of air except by the nares; simultaneously he contracts his tongue and obstructs the isthmus of the pharynx, while the glottis also may close spasmodically. Then he abruptly expands his thorax and inhales a

[1] Biaggi, *Arch. ital. di otologia*, 1897.
[2] Derevoge, *Thèse de Bordeaux*, 1898.

considerable quantity of air, yet is he ever on the verge of breathlessness, for he cannot voluntarily arrest himself, or make a break between two respirations. He seeks to continue speaking though his lungs are empty of air; he cannot control expiration by antagonistic contraction of inspiratory muscles; often he finds himself unable to commence speaking at all.

The glottis is either open, allowing the silent escape of air, or it is completely occluded. In the midst of syllables or words the voice is frequently "cut" by a sudden halt indicative of spasmodic closure of the glottis. A contrast to the ease with which vowels are pronounced is provided by the difficulty experienced in the enunciation of various consonants. Convulsive movements of the lips frustrate the endeavour to form the series of successive positions which the consonants demand.

An association of stammering with convulsive phenomena of a different nature has often been remarked. Instances of this have been given by Janke.[1] One patient takes a few paces backward, limping with his left leg till he finds something to give him support, and knocking his shoulder several times against wall or furniture, as soon as he encounters it; if he is seated he rises slowly from the chair, holding it with his hands the while, and forthwith falls back into his seat in order to begin. Another taps his fingers on his thigh whenever the word he is about to utter commences with "g" or "k."

In Brissaud's clinique we have met with a couple of instructive cases:

The first concerned a showman who used to exhibit a series of dissolving objects by means of mirrors, and who found one day that he could not speak without scanning his syllables and explosively ejaculating his words; at the same time his conversation was punctuated

[1] JANKE, III^e *Congrès des médecins tchèques à Prague*, 1901.

by sudden and exaggerated shutting of the eyes and by facial contortions. After a pause the inauguration of a phrase was ushered by still more energetic and widespread spasms of the head and even of all the body.

The other was an eighteen-year-old Jewish boy, who before beginning to speak gave vent to a hard sound like "kh" four or five times in succession, each being accompanied by a violent rotation of the head to the right, wrinkling of the face, and a little jump. The patient then addressed himself to speak with the utmost assurance, there being no sign of tic or stammer unless he stopped for a moment and endeavoured to recommence. On the other hand, he could sing to perfection.

There may also be troubles of speech of a tonic kind, whereby a more or less complete and sustained mutism is produced, an excellent example of which has recently come under our notice:

A young girl, various members of whose family are stammerers, occasionally suffers from an extraordinary sensation of anguish in the course of conversation; she flushes and then becomes suddenly immobile, finding it impossible to articulate or even to utter a sound. Her glottis contracts forcibly; her efforts at expiration are ineffectual, or else the air escapes in little explosive puffs, and at the same time her lips twitch and her eyelids flicker. The whole seizure is over in a few seconds, whereupon the patient launches into conversation with volubility, until pulled up by a fresh attack. She shows remarkable acumen, moreover, in an analysis of her symptoms. "What happens is that I am suddenly overwhelmed with the fear of being unable to pronounce a given word, and at the thought my lips are sealed, I cannot make a sound, my throat is compressed, my tongue refuses to obey me, and my condition becomes one of abject misery." Curiously enough her phobia is not related to a particular word, and moreover her articulation is accurate and not embarrassed in presence of certain of the consonants. Phonation and respiration are implicated as well as articulation. The origin of this "cramp of speech" in psychical abnormalities is manifest.

To a similar affection characterised by total inability to speak in a high or a low voice, whispering only being practicable, the term "spastic aphonia" has been applied. It is at the moment when the patient wishes to speak that the spasm occurs, as in a case reported by Hasslauer,[1] which resisted all treatment

[1] HASSLAUER, "Ueber spastischen Stimmritzen Krampf," *Militäraertz Zeitschrift*, 1900, p. 417.

and was considered by him to have features in common with hysteria and occupation neuroses.

There can be little doubt that the arrest of movement in these cases is comparable to what obtains in writers' cramp, and therefore, rigorously speaking, a tonic tic.

A case has been recorded by F. Pick[1] of a man of thirty-eight years of age afflicted with convulsive movements of the face and troubles of speech.

Whenever the patient tried to speak oral contortions and deviation of the tongue ensued, and hands and feet began to beat the air without his being able to utter a single word. The agitation was increased by emotion and diminished with volitional movement.

Another instance is referred to by Aimé[2] under the name of tic of elocution, where the combination of convulsive movements of neck, shoulder, and arm with spasm of articulation of eight years' standing disappeared under the influence of methodical re-education.

Kopczynski cites the case of a man with facial and other tics who used often to utter a long string of words or even a whole sentence in an extremely monotonous voice, resuming his natural tone thereafter; occasionally, too, he used to pause in the middle of a remark for as long as forty seconds.

Mention must be made here of true spasms of phonation or laryngospasms, the result of local irritation, which disappear with its removal. Central lesions, of course, might conceivably produce the same effect.

Uchermann[3] has reported a case of recurrent attacks of mutism at intervals of five or ten minutes in a man of sixty-eight, examination of whose larynx during the seizure showed the glottis to be in spasm. Synchronously with these rhythmical clonic alternations of adduction and

[1] PICK, *Société des médecins allemands à Prague*, March 10, 1893.

[2] AIMÉ, "Un cas de tic élocutoire," *Revue médicale de l'est*, January 1, 1901.

[3] UCHERMANN, *Arch. f. Laryngologie*, 1898, p. 326.

abduction occurred tonic contractions of the masseters and clonic contractions of the palate, tongue, and forearm. The phenomena had lasted for about a month when a right hemiplegia was superadded, and was followed by a fatal issue three weeks later. Unfortunately no autopsy was obtained to verify the observer's opinion of a lesion in the neighbourhood of the left precentral sulcus, involving the centres for mastication and phonation, for the tongue and for opening of the glottis.

If now we direct our attention to the content of speech, we shall see how it too may reveal anomalies not unlike tics.

Letulle quotes the case of a man who could not utter four consecutive words without sandwiching a "sir" between them. Similarly, the "don't you know," "do you see," "you know," of so many people are repeated *ad infinitum*. One of us has an acquaintance who interlards his talk with "you understand," and this formula is reiterated without modification though he may be addressing his friend in the second person singular.

There used to be a poor creature driven by destitution to sell papers in the streets, or to figure as a negro in the corridors of the Hippodrome, who was wont to garnish his speech with a "Well, my boy! all right, by Jove!" repeated at intervals, whoever it was he happened to be speaking to, and even though it was their first time of meeting.

In Ibsen's play of *Hedda Gabler* is a character George Tesman, a weak being who begins every sentence with "I say, Hedda," and ends with a no less invariable "eh!"[1]

These habitual words and phrases—and many more instances may be cited—are analogous to the mannerisms exhibited during concentration of the attention on the performance of certain acts. They cannot be considered tics unless reproduced at other times as well.

[1] GEYER, "Étude médico-psychologique sur le théâtre d'Ibsen," *Thèse de Paris*, 1902.

Moreover, while the use of such terms may be overdone, it can hardly be said to be unreasonable. However irritating their effect, they indicate simply an exuberance of style and a degree of inattention, not a grave mental shortcoming.

Of a less trivial nature is a curious anomaly that consists in the complication of speech by the introduction of meaningless expressions uncontrolled by the will. This is a functional defect very much akin to the tics.

A distinguished medical colleague was in the habit of muttering the word *cousisi* as he talked.[1] Séglas described similar occurrences as "stereotyped acts of speech." One of the Salpêtrière patients used to close every sentence with the phrase "in all and for all." Another's opening remark was always "Araken-Doken-Zoken." It is permissible to regard many of the neologisms imagined by the insane as examples of stereotyped speech. A patient, for instance, who suffered from delusions of persecution, said he was being pursued by the Evil Eye ("*reluquets*"—*reluquer*, to leer at). With the eventual disappearance of the association linking the original idea to the neologism, the patient may no longer be capable of explaining the meaning of the phraseology he has invented, but in the case of those whose mental level is more nearly normal the coining of new words need not be more than a sort of eccentricity, which is generally accompanied, however, by other indications of instability. We may remind ourselves of O., with his "vertigos" and "para-tics."

But if, finally, words or phrases escape the subject's lips at moments of silence, with whose imperious and unexpected emission he is powerless to cope, then we are dealing with true tics of speech. Their in-

[1] GRASSET, *Clinique médicale*, 1891.

vestigation has been conducted by Guinon with great analytical skill.

At the upper end of the ladder among exclamations we meet words involuntarily and senselessly repeated, in a loud tone of voice, to the accompaniment of tics and grimaces. These expressions fall naturally into two groups that require to be rigorously differentiated.

In the first of these the words uttered may be simply anything; each patient may have his own, and so their number is absolutely limitless. Occasionally one is in a position to discover in the antecedents of the case the reason for the choice of a particular word in preference to another, as in the instance of the man whose involuntary ejaculation, "Maria!" was the echo of a passion he had conceived years before for a young girl of that name.

Such troubles are unmistakable tics. The mechanism of their production is identical, be the actual localisation brachial, facial, or laryngeal, and this applies in particular to the motor verbal hallucinations so excellently studied by Séglas. As a matter of fact, tics of speech are often nothing more than the mode of exteriorisation of these hallucinations. The same is the case with verbal impulsions.

In this rubric of tics of speech we may class various cases recorded under differing titles, among which an interesting one due to Pitres may be quoted:

Subsequently to his retirement from active business pursuits, the patient, a man fifty-nine years old, became depressed, morose, and irritable, till insomnia at length drove him in desperation to attempt suicide. By the merest chance he failed of his purpose. The development of involuntary sounds a few weeks later was followed at the end of a month by the equally involuntary ejaculation of his wife's and children's names—"Numa! Helen! Camille! Maria!" This habit persisted for as long as fourteen months, after which during three years he enjoyed excellent health. Owing to financial worries, however, a relapse occurred. Every few minutes he uttered various articulate cries in a loud, clear, and well-modulated voice, sometimes repeating the four names with great rapidity, at others calling out the same name with increasing violence. Severe convulsive twitches of arm and trunk musculature synchronised with his exclamations. The patient was incapable of either restraining or even

modifying the cries; he was equally unable to replace one by another, to say Henry instead of Numa, or Jean instead of Helen.

For hours at a stretch he would repeat the names of friends who had come to visit him; on the day before a consultation on his case his one cry was the name of the new physician who was going to examine him.

A gradual improvement took place, and eighteen months after the onset of the condition the cure was complete.

In the same connection Pitres refers to a case reported by Calvert Holland.

A miner who had gone through the experience of incipient suffocation found himself two months later irresistibly impelled to exuberant speech. The rapidity and indistinctness of his enunciation of words were very much in evidence, as well as a tendency to stammering and to tautology. A further symptom consisted in rotatory spasms of the head; but after five months a satisfactory cure resulted.

We may cite a last instance from Ball:

A young girl was in the habit of kneeling down, making the sign of the cross, and repeating "Jesus, Mary, Joseph." The performance was limited to this order of events, but its practice in drawing-rooms and still more in thoroughfares led to her being certified as insane.

## ECHOLALIA

In his description of the disease which bears his name, Gilles de la Tourette used the expression echolalia to denote a certain phenomenon of occasional occurrence among those who tic.

The patient (says Guinon) repeats echo-like the sounds he hears around him, and like the echo his reproduction of them is more or less lengthy. In its mildest form the symptom may consist in the repetition of a simple involuntary "ah!" which some one near by has ejaculated, or the last word or two of some one's talk is mimicked, or in a more advanced stage the whole of a phrase is reproduced.

As a general rule the "echo" is rather obtrusive, but its commencement at least may be very different, the patient being astonished to find himself repeating in a subdued tone of voice what he hears others saying; and, struggling in fear to rid himself of the habit, he ends by sinking into a state of actual anguish. It is at this moment that he fails

to inhibit his impulses and gives vent to the word he has been endeavouring to check, which he may repeat loudly and violently in a sort of fury. The fidelity and clearness with which the utterances of others are imitated are remarkable.

Sometimes by an effort of the will the patient is able to suppress, it may be imperfectly, the impulse to echo, so that while his tongue is under his control, his will gives rein to his other tics, and a regular muscular debauch takes place. In the mildest cases he can replace a word by a movement, by a little cough or an insignificant "ahem!" but not beyond a certain point, for he will thus restrain himself only when he is forewarned; a sudden and unexpected ejaculation in his neighbourhood will catch him off his guard.

In spite of their frequency among those who are addicted to tic, echolalia and echokinesis cannot be enumerated with the tics, seeing that their exhibition is dependent on the actions of others, whereas once a tic is established it requires no stimulus from without for its manifestation. Of course their affinity to the tics is very close: they spring from the same soil; they represent in the adult the persistence and amplification of the child's propensity for imitation, and therefore in their own way postulate a degree of mental infantilism.

Echolalia in the blind has been made the subject of an interesting study by Noir.

The echolalic repeats abruptly and rapidly what is said by others in his presence. That he does not stop to reflect is attested by his mimicry of bizarre words, technical terms, even of idioms in a foreign language.

It is an interesting fact that of twelve cases of echolalia that have come under our observation, fifty per cent. occurred among the blind. The coincidence is a rational one; blindness and echolalia are united as cause and effect. In the case of the person born blind the auditory memory is in such an advanced state of development that, if he be not very intelligent, he will seek to fix the sound of an auditory impression in his defectively organised mind as soon as he hears it, and being unable to whisper it mentally, he stimulates his auditory centres by a less delicate process, and forthwith repeats aloud the word he has just heard. This is why we meet with instances of the echolalic blind repeating a sentence

before replying to it. It is instructive to note in this connection that the choicest example of echokinesis we have seen was in a deaf mute, in whom no doubt the visual phenomena were analogous to the auditory phenomena of the echolalic.

Noir is inclined to apply this mechanism to the case of echolalics who are not actually blind. He quotes instances which go to show that their visual memory is awanting, that as far as it is concerned they are "blind."

The hypothesis is attractive. It may be further remarked that the echolalic is a "motor," in the same way as the patient afflicted with hallucinations of sight or hearing is an "auditory" or a "visual."

Echolalia is amenable to treatment, and is even capable of cure. Noir gives an interesting example of the evolution of the process.

If I say to an echolalic, "Are you hungry?" he will instantly answer, "Are you hungry?" Under the influence of re-education the reply will eventually change to "Are you hungry? are you. . . . ? Yes, sir, I'm hungry," then to "Yes, sir, I'm hungry," and finally to "Yes, sir."

Echolalia, however, is not an exclusive appurtenance of those who tic. We can remember a case of general paralysis in the clinique of Brissaud at the Hôtel Dieu, who had the regular habit of repeating the question that was addressed to him; if it were a little long, only the last ten or fifteen words were echoed. A case is quoted by Cantilena of a woman with right hemiplegia and partial epilepsy who invariably reiterated the closing phrase of anything said to her. Several cerebral tumours were discovered at the autopsy.

It is conceivable of course that an actual lesion, as well as a congenital developmental defect, may interfere with the will's inhibitory powers, in which case auditory or visual stimuli are transmitted to motor centres unmodified, the result being the production of sounds or of other movements.

### COPROLALIA

Coprolalia, the *manie blasphématoire* of Verga, is, according to Gilles de la Tourette, one of the most frequent affections of speech in the disease of convulsive tics.

There is no necessary connection, as a matter of fact, between tic and coprolalia, though of course they may co-exist, sometimes in association with other syndromes; they are in reality only episodic syndromes of hereditary insanity.

A distinction ought to be drawn between coprolalia and the use of trivial or inconvenient terms, words with which even some well-educated persons are wont to garnish their conversation. Guinon had a case of a man who in the presence of his mother resorted to language of a kind absolutely disallowed in polite society. In the etymological sense of the word, no doubt, he was a coprolalic, but it cannot be said that he was suffering from tic.

On the other hand, the abrupt and impetuous utterance of oaths or obscene expressions, to the ejaculation of which an irresistible impulse seems to drive the patient independently of time and place, amounts to a coprolalic tic of speech, and reveals a deplorable volitional debility on his part; for he is incapable of checking an act to the impropriety of which he is fully alive.

The victims of this disease (says Guinon) have an extraordinary propensity for choosing the foulest and most indecent words, however elevated their position and correct their breeding. Reference may be made to the classic instance of the Marquise de Dampierre, who all her long life was in the habit of repeating certain immodest sayings even on the most solemn occasions.

According to Guinon the reason of this bizarre preference for obscene remarks is absolutely unknown,

although Charcot's view[1] that coprolalia is frequently nothing more than echolalia is one of some plausibility. He refers to one of his patients who alternated her coprolalic utterances with a sort of barking noise that was an exact imitation of her favourite dog.

We ourselves have had for a long time under observation a youth in the service of Professor Brissaud whom some instinct seemed to prompt to repeat any lewd expression he happened to hear, or indeed any which might be so interpreted. It might then be said of him that his coprolalia varied with his surroundings and with his own ideas; it was accompanied by inconstant and irregular convulsive movements of the limbs.

After all, there is not so very much to choose between the coprolalic and the individual whom impatience or anger forces to blaspheme or at any rate to utter words that do not form part of his ordinary vocabulary. And though the ejaculation be not audible, the first degree of coprolalia consists in the mental presentation of the objectionable phrase. Among those who suffer from obsessions mental coprolalia is far from uncommon. A patient with *folie du doute*, mentioned by Séglas,[2] was afraid to pronounce indelicate words because he felt himself articulating them mentally, and sometimes he used to ask whether they had not really escaped him. One step more, and these verbal hallucinations assume the characters of a genuine tic.

[1] CHARCOT, *Leçons du mardi*, October 23, 1888.

[2] SÉGLAS, *Leçons sur les maladies mentales et nerveuses*, 1895, p. 83.

## CHAPTER XI

### THE EVOLUTION OF TIC

TIC is, from its nature, highly variable in its evolution; each tic has a development peculiar to itself. Mental differences among individuals have their counterpart in physical differences, in health as well as in disease, and a comprehensive sketch of the evolution of tic is therefore impracticable. We shall restrict ourselves accordingly to a few general remarks.

In the great proportion of cases of tic the onset is an insidious one. We have already made a sufficiently detailed examination into the pathogenic mechanism to obviate any repetition in this place, but we may note how unsettled the earliest manifestations are, how a tic may pass from one muscle or group of muscles to another, and even when its exciting cause is patent an apprentice stage always precedes its final establishment. Of the truth of this the history of J. provides an excellent instance. Another one is from Pitres:

> A nine-year-old boy received a severe shock one day through being pounced on by some companions who were in hiding behind a wood pile, and though the emotion was of short duration, he commenced a few days later to exhibit involuntary muscular twitches of the upper part of his body, and to utter suppressed cries. The phenomena increased in violence and in frequency, and, in spite of treatment, a year later he was not freed of them entirely. For an unknown reason the tics renewed their activity when he was seventeen and continued so for the next three years, until a spell of Pitres' respiratory exercises effected a complete cure.

An evolution such as the above may be considered more or less typical of the great majority of tics.

We have seen that the tic may be localised indefinitely in one and the same muscle or muscular group, but its site may also vary from day to day. Two tics may coexist and coincide, or a third may appear with the disappearance of the others. Unexpected resurrections may succeed periods of complete repose.

Tic always shows a tendency to invade; regarded as a functional act, it moves in the direction of greater complexity.

After involving the orbicularis, for instance, a tic will spread to neighbouring groups, in particular to those muscles whose synergic contractions form a special expression of countenance. That is why tics of the eyelids are associated with movements of the pyramidales, frontales, and corrugators. Tics of the lips or of the alae nasi very commonly extend to the corresponding elevators. It is not surprising that muscular groups accustomed to act in physiological unison should also be affected together (Noir).

Moreover, the fecund imagination of the victim to tic is calculated to facilitate the invention of all sorts of modifications, complications, parodies, and caricatures of the functional acts on which his tics are grafted.

Tics are constantly varying in amplitude, degree, and frequency; as O. remarked spontaneously, "We have our good days, and we have our *mauvais quarts d'heure*." The sedative effect of rest, solitude, silence, and obscurity may be contrasted with the detrimental results of fatigue, noise, fear of ridicule, etc.

However incapable S. is of rotating his head to the right when requested to do so, the movement is executed with the utmost readiness should his attention be drawn in that direction. But if he hesitates, even momentarily, before looking round, he cannot then do so without the preliminary performance of all sorts of contortions, ending in a twist of his body through a half circle to the right. Sometimes he actually

turns round two or three times, after the fashion of a dog chasing its tail. Let him have a pleasant visit, on the other hand, let him engage in a discussion, or be engrossed in a play, let him administer a rebuke to some one, and immediately his trouble is forgotten, his speech is accompanied with animated gestures, the vicious position of his head vanishes—in short, he becomes normal.

An intercurrent affection may act either as a deterrent or as a stimulus; with convalescence, however, there is usually a re-establishment of the mischief. The most potent influence over the phenomena of tic is wielded by a sense of well-being, to employ Janet's discriminating expression. Well-being is a panacea for the *tiqueur* no less than for the hysteric. The tic of the worried financier disappears, as we have had occasion to note, under the magic of a rise in stocks or a knowledge of solvency. The child's happiness is bound up in his freedom, which explains the cessation, in Tissié's little patient, of all convulsive movements during the holidays.

Much evidence is forthcoming to support these points, but we must admit that the why and wherefore of a tic's amelioration or aggravation often escape us, nor must we forget that both in the child and the adult spontaneous cure is not unknown.

As has been remarked, the evolution of tic does not lend itself to systematic description, but there are cases that form an exception, their course being regularly progressive. Strictly speaking, they are instances of Gilles de la Tourette's disease.

### GILLES DE LA TOURETTE'S DISEASE

Under the title, "Study of a nervous affection characterised by motor inco-ordination, and accompanied with echolalia and coprolalia," Tourette[1] grouped to-

[1] GILLES DE LA TOURETTE, *Archives de neurologie*, No. 25, 1885, p. 19.

gether, in 1885, a certain number of cases presenting features in common and so enabling him to describe a morbid entity, specially remarkable for its progressive evolution. He was followed in the same line by Guinon, who supplied an account in nosographical form, and since then the disease has figured in all the text-books.

To obtain a schematic picture of the condition we shall borrow from Tourette's[1] last communication on the subject:

About the age of seven or eight a little boy or girl—for the sexes are affected equally—commonly with a wretched family history, begins to exhibit a series of tics. The attention of the parents is soon drawn to the fact, but they seldom give much heed at first, since the twitches are limited perferably to the facial musculature. At this stage, too, expiratory laryngeal noises are occasionally superadded.

The movements may be confined for a long time to the face, but under the influence of causes very difficult to determine they gradually invade the shoulders and the arms. First one shoulder is shrugged and then the other, then the trunk is inclined *en masse* to right or left; then the patient waves his hands or his arms, or bends backwards and forwards, or jumps up and down, flexing the knees alternately and tapping with his feet. The muscles of the larynx sometimes participate in the abnormal functioning, whence it is that many sufferers from tic give vent to quick expiratory "hems" and "ahs," which coincide often with the twitches of trunk and limbs.

The disease may be limited to this stage, but it is not uncommon to find, a few months or years after the beginning of the facial movements, that the inarticulate laryngeal sound becomes organised and develops in a particular direction, thus, in a sense, showing a pathognomonic value. Under the influence of causes whose action we are, in the majority of cases, powerless to appreciate, the patient gives vent one day to a word or short phrase of a quite special character, inasmuch as its meaning is always obscene. These words and phrases are exclaimed in a loud voice, without any attempt at restraint. There must be a complete absence of the moral sense where there is coprolalia such as this; at the moment of the ejaculation some irresistible psychical impulse must drive the patient to utter filthy words unreservedly and with no consideration for other people.

Another psychical stigma—echolalia—is occasionally, though less frequently, observed in these cases.

[1] GILLES DE LA TOURETTE, *Semaine médicale*, 1899, p. 153.

Such, then, is Gilles de la Tourette's disease, a clinical type of which many examples have been recorded. We do not think, however, that all tics can be brought under the same category; we lose sight of its distinguishing features if we make the attempt. Of course *fruste* and atypical cases are encountered, but even in them it is rare not to find a certain degree of mental instability in dependence on which echolalia and coprolalia rest, so completing the morbid syndrome, and it is important to recognise the successive development of these various constituents.

It is, indeed, this evolution of symptoms which is so characteristic of Gilles de la Tourette's disease. A careful scrutiny of recorded cases of tic, however, makes it abundantly clear that they do not all belong to the disease of convulsive tics; their localisation, form, and progress are so different that the effort to assimilate them to Tourette's disease would abolish the nosographical value of the latter. One patient may have an ocular tic all his life, and nothing else; the affection of another may be limited to a tic of the shoulder and arm; a third blinks and makes a facial grimace; a fourth is a coprolalic who has never suffered from tic. Are they all to be considered incomplete cases of the disease of convulsive tics? To answer in the affirmative is equivalent to a failure to appreciate the distinctive characters of a judiciously isolated syndrome, and a refusal to describe tics as they are met with in everyday life. One questions, in fact, whether some of the cases allotted to Tourette's disease really conform to it. Take an instance from Chabbert[1]:

A woman, aged forty-two, had had an injury to the left side of her face at the age of nine, as a result of which appeared a convulsive

[1] CHABBERT, "De la maladie des tics," *Arch. de neurologie*, 1893, p. 10.

facial tic, accompanied at times by hysterical attacks which continued for eight years. The tic itself, an abrupt contraction of the inferior portion of the left orbicularis palpebrarum, underwent no subsequent change, in degree or extent. At a later stage a fairly definite tendency to coprolalia became manifest.

An unvarying post-traumatic palpebral tic in an hysterical subject cannot be said to constitute the syndrome of Gilles de la Tourette, in spite of the coprolalia.

In another of his cases the diagnosis is no less open to doubt:

The son of the previous patient was a youth of nineteen, with a bad heredity on the father's side. In boyhood he had been a somnambulist. Some months previously to his coming under observation he developed a convulsive tic limited to the frontalis. Stigmata of hysteria were present in dyschromatopsia, restriction of the visual fields, and left hemihyperæsthesia.

A third case reported by the same author does probably belong to the disease of convulsive tics:

A woman aged forty-four, of a strumous diathesis, exhibited tics of face and limbs, occurring in the form of attacks sufficiently violent to cause bruises, attacks which were invariably associated with coprolalia. In addition, she suffered from echolalia, echokinesis, and *folie du doute*.

We can only repeat, of course, that each type of tic passes by insensible gradations into others that precede it or succeed it in the hierarchy of tics; but we must, provisionally at least, neglect the links that unite neighbouring groups if we are to avoid losing sight of admittedly distinctive characters in too comprehensive summaries. It is desirable to retain the term "disease of convulsive tics" for those cases whose progressive evolution ends in the generalisation of the convulsive movements, to the accompaniment of coprolalia and sometimes of echolalia. This clinical form represents the most advanced degree attained by

the disease; it might be called the tic's apogee. From its psychical aspect, moreover, the development it undergoes may culminate in actual insanity.

According to the teaching of Magnan, the disease of convulsive tics does not constitute an entity, since each and all of its symptoms may occur separately as episodic syndromes of degeneration. The general considerations with which we introduced our study are applicable in this connection, and we shall be content to say with Noir:

> We cannot deny the validity of the objections raised by Magnan and his school; but the fact that these various symptoms may and do most frequently occur singly is no reason for expunging the disease of Gilles de la Tourette from the text-books. The combination of these symptoms constitutes a clinical entity which has a specific evolution, and while its subjects are degenerates in the sense of Magnan and of Charcot, they may be ranged by themselves in a very definite group.

In some cases which apparently come under this category, psychical disturbance has not been a prominent feature.

Sciamanna[1] is the reporter of a case where a young man with neuropathic antecedents was afflicted with tics involving various muscular groups; his intellect, however, was normal, and the only psychical change was an insignificant disorder of affectivity.

In such a case it would be instructive to know the mental condition after the lapse of some years.

Two typical examples of Tourette's disease have been described by Köster[2] as "disease of impulsive tics"; a third case—in which widespread muscular twitches, the muscles of respiration and the cremasters

[1] SCIAMANNA, *Accademia medica di Roma*, 1893.

[2] KÖSTER, "Ueber die Maladie des Tics impulsifs," *Deutsche Zeitschr. f. Nervenheilk.* 1899, p. 147.

included, were coupled with sometimes a monotonous intonation and sometimes a jerky speech, though psychical functions were unimpaired—is considered by Kopczynski[1] to be a case of convulsive tic, which he distinguishes from the "disease of convulsive tics."

A last instance, published by Innfeld[2] as a case of "chronic progressive muscular spasm," is an unmistakable example of tic, in spite of the author's declaration that it does not correspond to any known morbid type and his attempt to liken it to chronic chorea. A boy of fifteen exhibited convulsive movements which had begun in the facial musculature and thence spread to the head, shoulders, and hands, and were accompanied with respiratory noises and involuntary exclamations. There was no alteration in sensation or in reflectivity, or in electrical excitability. Sleep banished while emotion aggravated the movements.

### VARIABLE CHOREA OF BRISSAUD

If the disease of Gilles de la Tourette, by reason of the uniformity of its symptomatology and the regularity of its evolution, justifies its differentiation as a separate entity among the tics, a comparison of it with another type, of polymorphic manifestation, irregular evolution, and uncertain duration, may prove instructive. We refer to the affection described by Brissaud as variable chorea.

The form of the motor reactions in this condition warrants the application to it of the term chorea, but the analogies the disease presents to tic are very close,

[1] KOPCZYNSKI, "Ein Fall von Bewegungsneurose in Form von Tic convulsif," *Gazeta Lekarska*, 1900.

[2] INNFELD, "Ein chronische, progressive Fall von Muskelkrämpfen," *Wien. klin. Wochenschr.*, 1898, p. 17.

nevertheless, and sometimes the two occur in the same individual. Patients suffering from variable chorea reveal the same mental abnormalities as are found among those who tic, while the troubles of motility are sometimes so similar to what we meet with in the latter that Gilles de la Tourette regarded the condition simply as one form of convulsive tic, the more so that it is occasionally accompanied by explosive utterance and even coprolalia.

This view, however, is calculated to obliterate the distinctive characters of the two affections, and ought not to be entertained. We cannot do better than repeat Brissaud's original description:

> The use of the word chorea need occasion no ambiguity: the chorea consists in the appearance of meaningless and apparently idiopathic involuntary movements, whose repetition during rest and action alike is proof of their irrationality and incongruity; the duration of the symptoms may be limited as in chorea minor or Sydenham's chorea, or unlimited as in chorea major or Huntington's chorea. "Variable" is the epithet we apply to the chorea because of the lack of uniformity in its exteriorisation, the irregularity of its development, and the inconstancy of its duration. It comes and goes, waxes and wanes, vanishes abruptly to reappear unexpectedly; it is a neurosis without a characteristic march.
>
> Notwithstanding the fact that we are dealing with a chorea—that is to say, with a disease which is almost as readily recognisable by the public as by any professional—the difficulty of fixing its onset is paralleled by the difficulty of knowing when it has ceased. This uncertainty is explained by the facile and changeable nature of the patient; until the condition is revealed by unmistakable signs it passes for an insignificant muscular caprice of no pathological importance, while its disappearance is not associated with any particular modification of the patient's ways.
>
> There is a natural tendency to identify all "nervous movements" with myoclonus, but the conception is a remarkably nebulous one, and means nothing more than "muscular twitch." On the other hand, it is well understood that "nervous movements" are more or less sudden movements of limbs, shoulders, face, always involuntary and generally increasing in force and frequency with the nervous state of the patient.
>
> Parents say, for instance, that their child has become more restless and irascible, and at the same time that he has had "more movements of the nerves." The coincidence is unfailing. Is the expression "nervous

movement" lacking in precision? Yet it signifies what it is intended to signify. We are concerned neither with tonic convulsions nor with clonic spasms, nor yet with tics of habit; what the term stands for is a complex contraction, brisk but not violent, closely allied to the simplest of automatic acts, such as a step in advance, a shrug of the shoulders, a frown, a sigh, a moan, a crack of the fingers, an exclamation —in any case usually a gesture of impatience. The whole thing, however, is so variable and fugitive, that it cannot be said to constitute a definite convulsive phenomenon. The contractions, further, in spite of their complexity, escape the notice of their originator, who is quite surprised at being asked the meaning of the movement he has just made, as he is almost entirely ignorant of it.

Briefly, the "nervous movements" of which we have been speaking do not belong either to myoclonus or to tic, but owe their distinctiveness to their multiplicity and inconstancy. At the same time they are always grafted on a certain neuropathic diathesis akin to that of chorea; in fact, they are nought else than a form of chorea themselves.

The psychical peculiarities of the patient with variable chorea may be summed up in instability of thought and action, combined with mental infantilism. Hence the terms "polymorphous chorea" and "chorea of degenerates" are used synonymously for variable chorea.[1] Sometimes the disorders of the mind include hallucinations, and various forms of phobia or mania.

One or two examples may be given:

A microcephalic youth of sixteen, a monorchid, developed what appeared at first to be an ordinary chorea subsequently to an orchidopexy. The movements, however, varied from day to day and from hour to hour. Sometimes they disappeared for days at a time, to reappear suddenly just when the neurosis seemed cured. The influence exerted on them by the will was both mild and transient. They constituted, in short, a particular kind of chorea, changing and changeable, and differing from intermittent chorea in that neither remissions nor relapses were ever wholly complete. Further, the condition was implanted on a basis of mental and physical degeneration, and seemed likely to become established as a permanent functional stigma.

In another case a peculiar chorea gradually supervened, for no obvious reason, in an adult female of tardy and imperfect physical and intellectual

[1] PATRY, "De la chorée variable ou polymorphe," *Thèse de Paris*, 1897.

development. It was difficult to decide whether the psychical or the somatic phenomena were preponderant; but to the material, tangible, and visible signs of constitutional inferiority was superadded a choreiform instability of the whole voluntary muscular system, consisting in agitation, gesticulation, and incorrigible motor restlessness, coupled with a conspicuous incapacity for rational action.

The steps in the evolution of this functional defect were very slow, and coincided with final confirmation of the intellectual insufficiency. As for the chorea, its localisation and its intensity, its increase and its decrease, its extension and its limitation, seemed to vary, in a way that could not be foreseen, at the call of certain undetermined circumstances.

In a third instance we meet with many of the symptoms already noted among those who tic:

X. is a well-developed boy of fifteen, but there is something peculiar about his physiognomy which defies analysis. If his mother's statements can be trusted, he is intelligent, quick, witty, sound in judgment, and blessed with an excellent memory. From the very first he has been eccentric, timid, and hypersensitive, and is to-day as tender-hearted and affectionate to his people as ever. He has various little "manias" of his own; he must have a knife, fork, and spoon for himself, and cannot take his food in comfort if they have been set before some one else. Each morning he dresses himself with extreme deliberation, then comes down to breakfast, of which, however. he will not partake unless he has touched all the door handles on his way. This little matter has developed into an obsession. His loathing of cold water is so pronounced that his morning toilet is rather a stormy proceeding, and as he is too old to be washed by his mother, the inevitable result is that his face and hands are never clean. At school he is both attentive and docile, finding pleasure in his study of the classics, but evincing a perfect passion for German. Anything German is a source of ineffable joy, so much so that he hugs his dictionary with childish exuberance. He listens deferentially to his teachers, but takes no note of what he hears. In German, Greek, and Latin he is at the head of his class, whereas in history and mathematics he is at the foot.

The "nervous movements" for which he has been brought to the consulting-room consist of a series of gesticulations akin both to tic and to chorea. Some are much more frequent than others, meaningless gestures executed spontaneously, one might almost say unconsciously. As he walks to school with his books under his left arm, his right hand roams over his person; and in the class-room the movements are

repeated. At table he rubs his back against the chair, and alternately flexes and extends his right leg. Apart from these "habit tics," he exhibits actual twitches of his muscles generally, and evidence of the consequent disturbance of his movements is furnished by a glance at his untidy bedroom, his disarranged books, his blotted papers, his slovenly clothes. When he goes out with his parents, he is never at their side, but lounges along in his own way, then suddenly hurries to regain his place by them, falling back again and occupying himself by crossing his legs, knocking his ankles together, shrugging his shoulders, grimacing, etc. All the movements can be arrested for a time by an effort of the will. At any one's behest he can maintain tranquillity for a minute, but the strain is too severe, and the muscular dance recommences sooner or later.

The movements are highly variable in type and degree, nor can the mother specify the date of their appearance. It is only during the last three years that her attention has been more particularly drawn to them, and their increasing gravity occasions her some anxiety. The boy has become the laughing-stock of his companions at school, hence he limits his stay there to the actual hours of his classes.

Three years later the choreic symptoms vanished. X. is to-day a stalwart youth, though still timid and eccentric. It is evident that in his case the variable chorea has been but an episode in adolescence, to be added to the numerous stigmata of degeneration enumerated above.

Notwithstanding its slow evolution (says Brissaud), the neurosis, in so far as it was a disorder of motility, seems to have completely disappeared. The importance of this for prognosis is fundamental, but from the point of view of diagnosis it is no less significant, seeing that the nature and form of the movements suggested chronic or Huntington's chorea.

A case described by Gilles de la Tourette[1] as disease of the tics seems really to have been one of variable chorea.

A woman of twenty-two, who had never been very strong, had an attack, at eight years, of involuntary movements of face and arms which prevented her feeding herself, and at the hospital a diagnosis of chorea was made. Two months later cessation of the movements allowed of her return to school, but a second attack followed after two years, and a third a year later. At the time of observation she was in the throes of her sixth relapse. Every one who had seen her considered the condition as chorea.

[1] GILLES DE LA TOURETTE, *Semaine médicale*, 1899, p. 153.

Tourette, however, was dissatisfied with the diagnosis. There was no suggestion of its being Sydenham's chorea, or hysterical chorea, still less of its belonging to Huntington's variety. According to the author, the muscular twitches were amorphous and indefinite, and characterised by extreme variability in form, expression, and intensity.

In our opinion the clinical picture is that of variable chorea, and we are confirmed in our opinion by a consideration of the patient's mental condition.

She comes of a pronounced neuropathic stock. One of her two sisters is nervous and impressionable, and probably a neurasthenic, while the other is subject to hysterical attacks. She herself is of a profoundly nervous temperament ; she cannot go to bed without assuring herself several times that no one is concealed beneath it ; she suffers from fears and dreads and obsessions of all sorts ; she is, in fact, an "unstable," a degenerate.

In one of our patients the symptoms were unilateral, constituting a variable hemichorea.

It is a matter of some difficulty to furnish an adequate description of the movements of the right arm. We note, first of all, that their activity depends on whether the arm is free or held in a fixed position. Voluntary movements are carried out stiffly, but are interrupted by sudden deviations, sometimes of rather a wide range, and highly irregular in distribution. Notwithstanding these breaks, the end to which the movement is directed is always attained with precision.

While L. was an apprentice dressmaker, she occasionally used to make various contortions with her arm, though if her attention was diverted they did not occur, and as a matter of fact she did her work well enough. Once she became familiar with the mechanical act of sewing, the involuntary performances ceased. Before her disease asserted itself, she had commenced to learn the piano, and she continued to make unimpeded progress, as her teacher discovered a method of holding her elbow which checked all convulsive twitches.

The involuntary movements of the right leg were so insignificant as to be almost negligible ; they united to produce a sort of irregular tremor which became appreciable only when the patient was very tired or very annoyed. Sometimes a long walk was followed by a certain hesitation in putting the right foot to the ground, and by defective

inhibition of the antagonists of the desired movement. Sometimes one foot was knocked against the other, and sometimes the right appeared to assume an equinovarus position. On the other hand, we have seen L. walking in the street with her father, when no anomaly could be detected in her gait. The distraction of any occupation such as dancing or playing a game has the effect, for the time being, of banishing the greater part, if not all, of the spasmodic phenomena.

This is undoubtedly a case of Brissaud's variable chorea of a unilateral type, and a consideration of the symptoms confirms the intimate relationship between it and tic.

Various intermediate forms have been noted. In one of Brissaud's cases, variable chorea and multiple tics coexisted. Féré [1] reports a case of variable chorea preceded by tic, and Bernard another in which starting, trembling, facial tic, variable chorea, etc., were associated.

Tics of phonation are often superadded to the gesticulations of variable chorea. Brissaud refers to the case of a girl of sixteen in whom involuntary movements resembling those of this type of chorea were coincident with a sort of hiccough, and a more or less inarticulate cry; at a later stage the movements became very infrequent, the hiccough was more constant, and the cry developed into a coprolalic ejaculation.

Variable chorea and variable tic are obviously very closely allied. The movements of the latter, however, are distinguished by their greater abruptness and smaller variety. They are tics by reason of their systematisation and co-ordination; they are variable because they pass from one region of the body to another. There is no necessary relation between them; each has an individuality of its own and is independent of the rest. In variable chorea, on the other hand,

[1] FÉRÉ, "Note sur un cas de chorée variable," *Nouv. icon. de la Salpêtrière*, 1898, p. 454.

one movement passes insensibly into another, and the variants of any particular one are legion.

However easy it is, then, to separate the two clinically, it is none the less true that they spring from the same soil of mental defect. Variable chorea differs in nature from other choreas, though its form is the same; it may be distinguished from tic by the type of movement, but in essence it is identical.

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## CHAPTER XII

### ANTAGONISTIC GESTURES AND STRATAGEMS

HOWEVER harmless and insignificant a tic may be, it is a source of annoyance to its subject of which he constantly seeks to disembarrass himself. But the feebleness of his will militates against any sustained effort, and if for a brief space he can conserve his immobility, victory eludes his grasp, for his tics resume the offensive and increase in violence. More than ever convinced of his helplessness, he resorts to measures that serve but to accentuate the mischief. Thus it comes to pass that he desists from his attempts at repression and admits himself vanquished.

Some there are, nevertheless, whose inventive faculty leads them to adopt singular attitudes, to execute curious gestures, to utilise elaborate apparatus—proceedings always more or less childish, whose employment is usually followed by success, but only for a time. The history of O. acquaints us with a whole series of these subterfuges, for which the expressive name of para-tics was invented by him, tricks intended to mask or to modify existing tics, but they soon themselves became as involuntary and as inevitable.

Not all who tic are imaginative enough to conceive such plans, and many have no thought of showing fight at all, but it is worth while dwelling on this point for a little, especially in view of the frequency with

which certain tics are accompanied by methods of correction evolved by the patient.

To begin with, we may quote the case of mental torticollis. The sufferer's head is irresistibly driven to the right, say, yet he replaces it immediately by the mere application of his right forefinger to his chin, and the correct attitude is maintained so long as the finger is applied. Of the variants of this efficacious antagonistic gesture the most common is the grasping of the head in the hands, or its support in the palm, or the simple contact of the fingers with chin, or cheek, or temple. In some cases the mere threat of this gesture suffices for the purpose. S. approximates his hand to his left ear, but before he has actually touched it his head turns spontaneously to the right. It would be difficult to find more conclusive evidence of the purely psychical value of such corrective acts.

Sometimes the resources at the patient's disposal are confined to one measure, though more frequently he avails himself of several, as in a case recorded by Sgobbo.[1] The antagonistic gesture may fail of its object if some one other than the patient put it to the test. Even with the expenditure of considerable force he may make no impression on the tonic contraction; this rule, however, is by no means general.

One of our patients, whose head used to be strongly tilted on to his elevated right shoulder, while his right arm was flexed, his left shoulder depressed, and his whole trunk deviated to the former side, was able instantaneously to resume his normal attitude by merely placing his thumbs one on either side of his head. If any one else sought to correct his vicious position he could do so by applying his fingers to two well-defined

[1] Sgobbo, "Un caso di torcicollo mentale," *Il manicomio moderno*, 1898, p. 424.

spots on the occiput, towards the base of the mastoid processes.[1]

Occasionally the antagonistic gesture is of the nature of a paradox. We may cite an example from Raymond and Janet.[2]

> If we ask the patient whether she cannot sometimes prevent her head from rotating, she declares she can, and demonstrates how it is done by lightly touching her forehead with her finger tips. Now, in view of the fact that her head is deviated to the left and backwards, it will be seen that no pressure exerted in front could obviate this. What really happens is that at the moment of contact not only does she inhibit the movement by the aid of her will, but she also makes a slight forward inclination of her head to rest it on the point of support. No performance of this description could have any efficacy in the case of a genuine spasm due to irritation on a reflex arc.

At length the day arrives when the hand is unequal to the task, and the patient endeavours to utilise more resistant bodies, such as the back of a chair or the wall of the room, as in a case of retrocollis reported by Brissaud. These devices in their turn prove insufficient, and relief is obtained only in the recumbent position. Fournier[3] has seen a case of convulsive twitching of the right sternomastoid and trapezius arrested when the head was reclining on a pillow.

Even in bed, however, there is usually something to complain of: the pillow is too high, or too low, or too soft; the rustle of the packing is disagreeable, the sheets are too rough, etc., etc. It is then that all sorts of unlikely arrangements are adopted, and the patient puts his head under the bolster, or lets it hang over the edge of the bed, or piles up additional cushions and mattresses calculated to retain it in the desired situation.

[1] FEINDEL AND MEIGE, "Quatre cas de torticolis mental," *Arch. gén. de médecine*, January, 1901, p. 61.

[2] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 377.

[3] FOURNIER, "Tic rotatoire," *Thèse de Strasbourg*, 1870.

Frequently the stratagems are highly ingenious and complicated.

Madame K.,[1] forty-three years of age, suffers from clonic movements of the head which disappear with the adoption of a torticollic attitude, the face looking to the left. Nothing is easier than voluntarily to correct this attitude, but the clonic movements at once reassert themselves, although they may momentarily be kept in abeyance by placing the hand on the chin.

Numerous and ingenious have been the devices framed by this lady, but in no instance has their success been other than transient. Her latest invention is a stiff high collar fashioned of several thicknesses of a heavy material. At the risk of strangling herself she has so compressed her neck that no movement is possible, but the right arm has now become the seat of action.

A patient of Grasset[2] used to promenade in the grounds of the hospital holding a cane in his teeth and maintaining his head in position by keeping one finger on the end of the stick.

Another patient, under the care of Noguès and Sirol,[3] whose head was fixed in irresistible anteroflexion and rotation to the left, had invented a most elaborate piece of apparatus, the adoption of which was followed by perfectly satisfactory results. On the frame of a pair of pince-nez deprived of the glasses he fixed a piece of iron wire ten centimetres long in such a way that it stood out from the spring at right angles to the plane of the pince-nez. It was sufficient to wear this thing on his nose to inhibit the spasm, and to be able to talk, walk, do anything unhampered by his torticollis; it was not even necessary to concentrate his gaze on the extremity of the rod.

In the case of one of our patients, N., whose head we had on several occasions succeeded in keeping straight while he was writing by directing a pin towards

[1] FEINDEL AND MEIGE, "Quatre cas de torticolis mental," *Arch. gén. de médecine*, 1901, p. 61.

[2] GRASSET, "Tic du colporteur," etc., *Nouv. icon. de la Salpêtrière*, 1897, p. 217.

[3] NOGUÈS AND SIROL, "Un cas de torticolis mental," *Nouv. icon. de la Salpêtrière*, 1899, p. 82.

his left cheek, the idea was entertained of utilising this procedure out of doors, and accordingly a long pin was fixed in the collar of his overcoat. There never was the slightest prick on his cheek, but we strongly dissuaded him from the continuation of this objectionable practice.

Antagonistic stratagems of this kind are met with in other tics.

A curious case of mental trismus is reported by Raymond and Janet,[1] where the patient always spoke through his clenched teeth, but opened his mouth widely enough when showing his tongue or when eating. To overcome the tonic contraction of his masseters he used to insert a minute piece of cork between his jaws, though he could also open them to articulate properly by holding his chin with his hand.

Chatin's patient[2] nullified the permanent contraction of his masticatory muscles by insinuating his little finger between the dental arches.

In this connection reference may again be made to the fixation attitude adopted by young J.[3] for his left arm, a subterfuge of his own invention which he considered a sovereign remedy. In essence it was nothing else than an efficacious antagonistic gesture, inspired by a tic and become its indispensable complement. Of other ingenious ideas of his brief mention may be made.

Convinced of the necessity and possibility of checking the movements of his shoulder, he sought the aid of his "immobilising mattress," an ordinary mattress spread in a corner of the dining-room, on which he flung himself and reclined from morning to night, making the wretched thing his companion, solace, and confidant, who alone understood and

[1] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 381.

[2] CHATIN, "Note sur un cas de trismus mental," *Rev. neurologique*, 1900, p. 310.

[3] MEIGE, "Histoire d'un tiqueur: tics variables, tics d'attitude," *Journ. de méd. et de chir. pratiques*, August 25, 1901.

could alleviate his tics. In his anxiety to find some point of resistance for his left arm to work against, he had a second and much narrower mattress put under the first, so that prodigious efforts were required on his part to maintain equilibrium on the cylindrical surface. This was exactly what he desired, and for a time he ceased to tic.

An equally curious case is that of one of Raymond and Janet's patients afflicted with multiple tics.[1]

He was a man thirty years old, who denied having had tics for more than four years; he had always been eccentric, however, and came of a family some of whose members were dullards and others hysterics. His career at school and college was brilliant, but his vain and erratic disposition had prevented him from realising his boundless ambitions, and carrying into effect many ingenious schemes. For that matter, a prominent trait in his character was a curious scrupulousness that led him to seek an impossible perfection for all his actions. Anything he put his hands to he thought might be better accomplished if he had a system for the purpose; he had, for instance, all sorts of plans for improving his caligraphy, for holding the pen, interminable "tips" for correct punctuation, for learning, for reciting. To such an extent was he embarrassed by these procedures that he could not write two letters consecutively. Purposeless voyages to Africa ended in his contracting conjunctivitis, malaria, and dysentery, and he returned to France worn out and more eccentric than ever. Thereafter the state of his health, and above all his functions of respiration and digestion, became matters of absorbing attention. A system had to be thought out for breathing better and for avoiding possible suffocation. He next devoted himself to the question of alimentation, and conceived the idea of moistening each mouthful of food with water, soon finding it desirable to wet his lips, apart from meal time, in order to breathe better. One day during a journey by train he suffered agonies from want of his drop of water.

Examples such as these serve to illustrate how the misplaced ingenuity of the sufferer from tic complicates his misfortunes instead of banishing them, and indicate to what extremes his eagerness to obtain respite may lead him.

All these gestures and stratagems may be considered as manifestations of ideas of defence, comparable to what obtains among those afflicted with obsessions and delusions of persecution.

[1] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii. p. 385.

## CHAPTER XIII

### THE COMPLICATIONS OF TIC

FOLLOWING in the train of the tics may come a number of complications, insignificant enough as a general rule, the dread of which may in some cases actually be instrumental in stimulating the will's activity to rid the patient of his tic.

Dislocations have in violent cases been known to occur. Incessant repetition of a tic may lead alike to hypertrophy of certain muscles and atrophy of their antagonists, conditions which in aggravated instances may produce permanent malformation.

It is of course in cases of spasm and other convulsive phenomena dependent on structural disease of nerve centres or conductors that such trophic disturbances are most liable to occur. Gaupp[1] has described a case of partial congenital myotonia localised in the muscles of the forearm and hand, and associated with atrophy, in a patient presenting certain stigmata of infantilism; but the condition can scarcely be classed with the tics.

As for actual paralysis supervening on a tic, the case recorded by Grasset[2] of a young girl in whom a tic of the right leg was succeeded by a trailing movement of the same limb in walking can hardly be considered conclusive, inasmuch as such incidents

[1] GAUPP, *Centralb. f. Nervenheilk.*, February, 1900.
[2] GRASSET, *Clinique médicale*, 1891.

usually indicate hysteria or functional disturbances akin to tonic tics.

Biting tics are more apt to be accompanied by various sequelæ, such as mutilations, excoriations, ulcerations of all sorts. By constant nibbling at his lip J. produced an erosion of the mucous membrane, which became infected and developed into an ulcerative stomatitis. The accident, however, had a salutary effect on his tic.

We may quote another illustration from the history of the same patient to show how complications may sometimes be of curative value.

In January, 1901, in consequence of excessive cudgelling of one fist by the other, the back of the left wrist became inflamed and painful, but the bruise soon disappeared. In April of the same year, however, a large reddish ecchymosis made its appearance in the neighbourhood of the left elbow, with a painful swelling of the whole arm on the proximal side, and a few days later the discovery of a hard, cordlike mass along the border of the biceps made it clear that phlebitis had set in. With proper treatment the symptoms gradually diminished in intensity, but there can be no doubt of their origin in the reiterated violence of J.'s onslaught on his left arm.

The immediate outcome of the event was to put a brake on his exuberant gestures, and although the impulse was still sometimes urgent enough to tempt him to recommence, the thought of his phlebitis and fear of the dangers of a relapse were sufficient to recall him to his senses.

Apropos of complications the case of O. occurs to the mind, his biting tics ending in the premature loss of all his teeth, while his habit of rubbing his nose and his chin against the back of a chair led to the development of callosities. Tonic tics of the neck may in cases of long duration result in permanent deformities.

Apart from such complications, the vast majority of the accidents that accompany tics are attributable to various concurrent affections. A case reported by

Féré[1] of rotatory movements of the head passing some years later into the initial symptom of epileptiform convulsions ought not, in all probability, to be placed among the tics.

As for the grave mental affections that sometimes are superadded to long-standing tics, it is unjustifiable to class them as complications; they are rather manifestations of psychical instability that have found a suitable medium for their evolution; in many instances they occur quite independently of the tics.

It may, however, be remarked that the persistence of a tic entails ceaseless preoccupation on the part of the subject, and may thus pave the way for obsessions or hypochondriacal ideas. The motor disturbance reacts adversely on the mental state of which it is the outcome. Hence an obsession may give rise to a motor display that has all the appearance of a tic, while the motor act in its turn may become an actual obsession.

[1] FÉRÉ, "L'épilepsie et les tics," *Journ. de neurologie*, 1900, p. 309.

## CHAPTER XIV

### THE RELATION OF TICS TO OTHER PATHOLOGICAL CONDITIONS

A VAST number of disturbances of motility, distinguished as spasm, chorea, cramp, myoclonus, myotonia, etc., may be derived from the same pathological substratum as tic, and an equally vast number of psychical anomalies may spring from that psychopathic diathesis of which tic is merely the motor expression.

The frequency of these associations is confirmed by innumerable clinical observations, many instances of which have been given already.

That the relations between tic and other diseases of the nervous system are very intimate is patent from every-day experience; such and such a tic may be succeeded, in the same individual, by a much graver condition in the shape of mental disease, general paralysis, tabes dorsalis, etc. Inversely, some cases of chorea seem to terminate by leaving no trace of their occurrence beyond some little convulsive movement or tic. The position tic occupies is, then, a peculiarly interesting one, for it may be the starting-point of another affection, it may be an intercurrent phenomenon, or it may persist as the reminder of some previous disease. For this reason it well merits attentive study.

In this chapter we shall examine the connections of tic with hysteria, neurasthenia, epilepsy, mental disease, and idiocy respectively.

### TICS AND HYSTERIA

Our response to the question whether tics are hysterical in origin is a direct negative. Without attaching pathognomonic significance to stigmata, we may remark how seldom they are encountered among those who suffer from tic, and how rarely the latter exhibit any of the paroxysmal manifestations of hysteria.

Modifications of general sensibility such as anæsthesia or hyperæsthesia are unknown; the special senses are intact; in particular, contraction of the visual fields is never met with. Though these signs are negative, their importance from the point of view of diagnosis is none the less real.

The mental condition of patients with tic is no doubt analogous to that of hysterical cases, but it is no less common in many others that present no sign of that neurosis. There is little or nothing in tic characteristic of hysteria, and one sometimes questions whether the *soi-disant* hysteria of certain subjects of tic is the real disease.

In the same way as all who are predisposed, the sufferer from hysteria may develop a tic or tics, and although tic was held by Briquet, Axenfeld, Bouchut, and others, to be merely an accessory symptom of hysteria and *nervosism*, these doctrines were propounded prior to the analytic researches of Charcot.

Pitres,[1] whose opinion is so weighty in matters neurological, considered a predisposition to tic as a sign of hysteria, for which neurosis the subjects of tic were candidates, and supported his contention by various clinical examples:

A resin-gatherer of Landes carried all day from tree to tree a

[1] PITRES, *Leçons sur l'hystérie*, vol. i. p. 317.

notched stake of wood by which to climb up the pine-trunks. The weight of it on his left shoulder began to cause a slight but persistent aching, which was followed by involuntary deviation of the chin to that side. The movements took place at the rate of ten to thirty a minute, but diminished materially in frequency and degree whenever the patient lay on his left side, or when he inclined his head voluntarily on either shoulder, and disappeared entirely if he was asleep, or if he sang, or whistled, or recited in a loud voice.

Examination of his visual fields revealed a marked restriction, and every effort to cure the condition proved ineffectual.

Pitres' conclusion is that the condition is one of tic, probably caused by the habit of carrying the stake, and probably also of hysterical origin. It is true the hysteria is reduced to its most simple elementary symptomatic expression, but it is difficult not to recognise its activity in the concentric contraction of the fields of vision.

Nothing is more likely, we think, than that we are dealing in this instance with a tic occasioned by a professional act, but we doubt whether alterations in the visual field are sufficient to justify a diagnosis of hysteria.

In another case of the same author, where a facial tic made its appearance in a hystero-neurasthenic after a series of worries, the association of the two is of course undeniable, but it does not follow that tic is in essence hysterical.

Take another example from Chabbert:

A little girl of twelve years, with a bad family history, began to exhibit involuntary movements as the result of a succession of frights, which led at the same time to the production of certain hysterical phenomena. The stigmata were unmistakable, and in addition the girl was an echolalic.

Here there seems to have been a combination of hysteria with the disease of convulsive tics. Charcot,[1]

[1] CHARCOT, *Leçons du mardi*, October 23, 1888.

however, drew a sharp line of distinction between them, although they may co-exist in the same individual.

Apropos of this subject Raymond and Janet[1] call attention to the fact that in the somnambulistic state the memory may be much more extensive than in the waking state, and may recall events that have not passed the threshold of consciousness, which nevertheless have been the determining cause of various phenomena of the conscious life. In this way may be explained the genesis of certain tics, although it is not a necessary sequel that they themselves are stigmata of hysteria.

Sometimes, however, that disease does appear to play an indispensable part in originating convulsive movements. An interesting case in point has been published by Scherb[2] as "beggar's tic."

The patient is a young girl eighteen years old, born of an alcoholic father and an hysterical mother, and brought up amid deplorable surroundings, socially and morally. At the age of seven she contracted diphtheria, and a doctor was called to visit her. The mere sight of him so frightened her that the whole of the right side of her body went into a state of contracture, with mouth and eye deviated to the right, the arm pronated and adducted, the leg stiff and the heel raised off the ground. Some gradual improvement took place after a month, but her mother saw in the incident a means of attracting public sympathy, and encouraged the child to maintain the vicious attitude by sending her into the streets to beg. And so she appears to-day, her right foot trailing, her toes flexed, her forearm bent, her hand extended and fingers curled up. Whenever the patient is unobserved or forgets her professional attitude, at once the arm resumes its normal position and activity.

An examination of sensation reveals a hyperæsthesia of the right half of the body, with *points douloureux* over the left ovary and the left mamma, as well as over the larynx. There is no contraction of the visual fields; reflectivity is normal; Babinski's sign is absent.

[1] Raymond and Janet, *Névroses et idées fixes*, vol. i. p. 397.

[2] Scherb, "Hémispasme tonique du côté droit constituant un tic mental professionnel: tic de la mendiante," *Soc. de neur. de Paris*, May 3, 1900.

The author considers the case one of "professional mental tic" in a predisposed patient—in other words, the tic is a "mental bad habit" in an individual psychically abnormal.

There is a certain analogy between this condition and mental torticollis in the insignificance of the effort by which the patient corrects the deformity, compared with the great force exerted by any one else to obtain the same result. Yet the symptoms strongly suggest hysteria; their unilaterality, and the combination of motor and sensory alterations, are altogether too special to have been caused by any other morbid process.

Of course everything depends on the exact interpretation to be put on the word hysteria. As far as we are concerned, to consider a symptom of hysterical origin because it seems to be purely functional is sadly to misunderstand the question. The absence of what we call organic signs is a negative feature common to all neuroses, each of which, hysteria included, ought to have definitely fixed limits.

According to Babinski,[1] hysteria is a mental state which renders its subject capable of auto-suggestion. The distinguishing mark of the condition is that its symptoms may be reproduced with mathematical accuracy by suggestion, and may by similar means be made to disappear.

Now, while auto-suggestion may undoubtedly be a factor in the evolution of tic, it is rather too much to maintain that an "evil suggestion" may constitute a tic by itself, and we question whether the influence of persuasion alone will suffice to bring about a cure. Nothing short of re-education, faithfully practised for months and years, will produce any effect, and even this

[1] BABINSKI, "Définition de l'hystérie," *Soc. de neur. de Paris*, November 7, 1901.

method seldom results in more than a progressive amelioration. Sudden cures are familiar in hysteria, but unknown in tic. Treatment by hypnotism is rarely successful unless the patient is also a full-fledged hysteric, and this is quite the exception.

### TICS AND NEURASTHENIA

The relations between tic and neurasthenia need not detain us. Neurasthenic and *tiqueur* alike may suffer from aboulia, obsessions, and nosophobia, and the same depressive causes may favour the establishment of the two diseases; but this is true of any form of psycho-neurosis. To identify the one with the other is to misinterpret the physical signs of the condition as described by Beard. The term neurasthenia has been so badly abused that its fundamental symptoms have been lost sight of. Yet the polymorphic nature of these symptoms is no reason for failing to recognise the genuineness of the neurasthenic syndrome, characterised as it is by headache, rachialgia, topoalgia, gastro-intestinal atony, neuro-muscular asthenia, insomnia, and mental depression. The occurrence of any one of them in a case of tic is of no special significance; for the diagnosis of neurasthenia rests on their combination, and it is precisely this combination that is so exceptional in tic.

From time to time the co-existence or alternation of tics and headache has been remarked, but the headache bears a much closer resemblance to migraine than to the headache *en casque* of neurasthenia.

Whatever be the variety of tic, the remarks we have made, based as they are on clinical observation, are applicable to it. In particular, they have a direct bearing on Cruchet's psycho-mental tic. To quote that author again:

Hysteria and neurasthenia are two diseases which we meet at every turn in our study; and if we remember that, according to Raymond, fibrillary chorea of Morvan, paramyoclonus multiplex of Friedreich, electric chorea of Hénoch-Bergeron, painless facial tic of Trousseau, and disease of Gilles de la Tourette-Charcot, are all mere varieties of myoclonus, which is itself a product of neurasthenia and hysteria, we are forced to admit that it is these conditions which dominate our conception of psycho-mental convulsive tic.

Thus it comes to pass that tic is lost in a crowd of widely differing convulsive phenomena, and is threatened with the permanent loss of its distinctive characters, while hysteria itself is like to become a perfect Proteus once more. Neurasthenia too is again to sink to the level of a receptacle for all manner of ill differentiated conditions.

We, on the contrary, feel it more than ever incumbent on us to resist the tendency to class in the same section facts which clinical observation distinguishes, otherwise hysteria and neurasthenia will soon signify nothing at all. If tic is to be considered one of the polymorphic manifestations of these diseases, we shall be transported back fifty years, to the time of the famous "chaos of neuroses," out of which, in some ways at least, Charcot finally produced order.

## TIC AND EPILEPSY

The co-existence of epilepsy and tic has been noted sufficiently often to open the question of their possible relationship. Of course the mental state of epileptics is such as to favour the development of tics. Usually, however, the convulsive phenomena supposed to be of the nature of tic merit some other description.

In the first place, they may be Jacksonian in type, and under these circumstances confusion is scarcely possible. It is not without interest to compare the gestures and stratagems of defence which sufferers from tic devise,

with the procedures adopted by some Jacksonian patients, such as compression of the arm or wrist by the fingers, or by string or more elaborate apparatus. There might conceivably be some hesitation in making a diagnosis if it depended on these arrangements, but the mere observation of one actual attack will dispel all difficulties.

We may mention the convulsive seizures of idiopathic epilepsy only to dismiss them. Loss of consciousness is an unfailing criterion.

It is more especially the association of epilepsy with the ill-defined group of myoclonus that we propose to discuss.

According to Maurice Dide,[1] myoclonus, which he calls motor petit mal, occurs in five per cent. of cases of epilepsy. Attention has also been directed to this question by Mannini[2]:

> After an attack of epilepsy the convulsive twitches are at a minimum, but during the next few days the myoclonus, or rather the polyclonus, becomes increasingly intense and varied, until it reaches a maximum, which is crowned by a second epileptic fit. The spasmodic contractions begin in the face and invade the rest of the musculature; they recur in the form of seizures at diminishing intervals, leading to the epileptic attack, when the muscles pass into permanent contraction.
>
> Sometimes the myoclonus takes the shape of fibrillary spasm, sometimes the whole of a muscle is involved; the twitches may be rhythmical and symmetrical, or arhythmical and asymmetrical, so much so that at a given moment the patient may present the clinical picture of convulsive facial tic, or paramyoclonus multiplex, of Gilles de la Tourette's disease, or electric chorea.

Mannini's view is that the varying convulsions known as myoclonus or polyclonus are akin to epilepsy, and are the outcome of the same cortical lesion, the nature

[1] DIDE, "La myoclonie dans l'épilepsie," *Annales médico-psychol.*, September—October, 1899.

[2] MANNINI, "Policlonia ed epilessia," *Gaz. degli osped. e delle clin.*, September 30, 1900, p. 1220.

of which has not as yet been fathomed—a lesion whose expression is hyperexcitability of the cells of the rolandic area. Analogous conclusions may be drawn from a case of epilepsy and myoclonus, with autopsy, reported by Rossi and Gonzales,[1] where a general ischæmic degeneration of the central nervous system was found, the greatest changes being discovered in the rolandic zones of each side, as well as in the extremities of the three frontal convolutions. Schupfer[2] has recorded cases of family myoclonus with epileptiform attacks.

We are content to note the facts. Any conclusion applicable to the tics is premature.

Various observers have drawn attention to the development of tics in persons formerly subject to epilepsy. Malm[3] has described a case of rotatory tic in a man who has been a known epileptic for ten years. According to Féré,[4] epilepsy may supervene in patients who at one time suffered from tic. As an example, he quotes a case of tic localised in the left ear and dating from infancy; the patient had reached his thirty-fifth year when the recrudescence of the tic ushered in the first attack of epilepsy, which consisted of elevatory movements of the left ear and convulsions of the left half of the face, passing thence to the right arm and the left leg, and becoming generalised. The fact that the twitches of the left ear could not be imitated voluntarily suggested that the original "tic" may have been the result of some minute cortical irritation, the increase of which became eventually the determining cause of a Jacksonian attack.

Another case due to the same author concerns a

[1] Rossi and Gonzales, *Annali di nevrologia*, 1900, fasc. 4.
[2] Schupfer, "Sulle mioclonie," *Il policlinico*, 1901, vol. viii. p. 1.
[3] Malm, "Tic rotatoire," *Allg. med. Centralzeit.*, 1899, No. 64.
[4] Féré, "L'épilepsie et les tics," *Journ. de neurologie*, 1900, p. 309.

woman of fifty-four years, subject from her youth to fixed ideas.

For the last four years she has had seizures which may be attributed to her idea that she must see the whole of the objects on her left. Under the impulse of this idea, she turns her eyes upwards and to the left, rotates her head in the same direction, and her body too, if she happens to be on her feet. The performance is gone through fifteen or twenty times a day.

In addition, she suffers from epileptiform attacks, which commence by this deviation of head and eyes to the left, and spread to the arms and to the left leg, leading to loss of consciousness as they become generalised. The patient finally succumbed to an apoplectic stroke followed by left hemiplegia.

In this instance the connection between the fixed idea and the patient's gesture favours the diagnosis of tic, but the subsequent history of the case makes one consider it with reserve. All such cases ought to be followed up carefully, and we may modify Féré's conclusions somewhat to declare that the appearance of a convulsive movement in an adult, or the aggravation of a similar movement of ancient date, should lead one to suspect epilepsy and to look for signs of it: "The patient runs more chance than risk in being treated as an epileptic."

We have had the opportunity of observing, in one of our mental torticollis cases, a condition not unlike what is known as *absence épileptique*. The term "incantation" was applied by the parent to his daughter's habit.

On two occasions we noticed the patient's eyes turn upward and remain fixed for a moment or two, while her expression changed to one of tranquillity and unconcern—a sign of distraction, not of ecstasy. She merely appeared to be thinking of something other than the immediate topic of conversation, and after two or three seconds resumed her ordinary ways.

These brief "absences" are trifling enough, of course, but their painstaking study is of inestimable aid in the matter of diagnosis. They

began at the age of seven or eight, and at first occurred as often as sixty times in a day. What the patient did was to raise her head, and turn up the whites of her eyes; in a second or two her countenance had resumed its ordinary expression. From their onset, the "incantations"—to use her father's term—gradually increased in frequency and length, and attained a sort of maximum when she was eleven years old, slowly diminishing thereafter till at present they have become rather exceptional. They proved to be a source of great tribulation to L., seeing that she was exposed to the practical jokes of her companions, who used to seize the occasion to relieve her of any books or toys she had in her hand.

During the "absence" there is no change of colour, nor has there ever been any vertigo or sense of rotation. She has never actually fallen, though she has allowed things to drop out of her hands. Once it is over, she is aware of it, but her memory of what has just taken place is very vague, though she usually can tell what preceded it. She can be aroused from the "incantation," to sink back into it an instant later, as though she had not dreamed enough. Sometimes a series of "incantations" occurs, one following on the heels of another. Occasionally she utters such words as "yes, yes!" or "no, no!" in an impatient tone of voice, and plucks at her hair or clothes, or toys with the handkerchief which is never out of her hands.

Call these phenomena "epileptic absences" if you like, but after the reverie is over, L. knows quite well that she has had it; besides, prolonged bromide treatment has been totally inefficacious.

One of us has come across a somewhat similar condition in a ten-year-old girl:

Fifty times a day she interrupts her work or her play to retract her head and roll her eyes upward. The duration of the attack is not longer than ten seconds, and there is no cyanosis or distress of any kind. The application of tactile or painful stimuli at these times makes her shut her eyes and withdraw her head or her limbs, and she can tell afterwards what was done. She knows that she has had a "sensation," and remembers any noise that occurred while she was in that state.

Otherwise, there is little to note. For one month she presented very mild convulsive movements in the left arm and leg, but no trace remains of them to-day. Treatment with bromides has failed to effect any modification.

Examples of the same nature, but said to be of

hysterical origin, have been recently published by Luzenberger:[1]

A young girl, twelve years of age, has brief attacks in which she loses consciousness, and turns her head to the right, while the angle of the mouth is drawn to the left. This sort of attack recurs forty or fifty times a day, and has been going on for three or four years.

The reporter thinks the case a difficult one to diagnose, though the trifling nature of the symptoms, and their evolution, do not suggest epilepsy. One may question, however, whether they indicate hysteria.

Our sole object in referring to these cases has been to note the co-existence of these "absences" with motor phenomena closely allied to the tics, if not with tics themselves. We cannot be satisfied with finding a common bond for all such conditions in mental degeneration, but it is perhaps premature to seek to interpret the facts.

### TICS—INSANITY—IDIOCY

Insanity in any of its forms may be accompanied by clonic or tonic convulsive movements—movements that may be of the nature of tics or spasms or stereotyped acts, or that may belong to conditions which we distinguish by the names of myoclonus, polyclonus, myotonia, catatonia, etc. It is highly probable that many instances have been described as spasms which, according to our nomenclature, must be considered tics. Brodie, to take an example, quotes a case where a "spasm" of the spinal accessory was replaced by a mental affection. Alternation of hallucinatory mental confusion with "spasm" of the neck muscles has been observed by Oppenheim, as well as a case where the "spasm"

[1] LUZENBERGER, "'Absences' psichiche in isterici," *Riv. speriment. di fren.*, 1900, p. 822.

originated in the course of an attack of alcoholic mania. In another, due to Gowers, "spasm" of the muscles of the neck was preceded, at a ten years' interval, by an attack of melancholia.

Most of the cases of this nature would be held to-day to be instances of mental torticollis.

That tics and mental disease accompany each other is notorious, but a discussion of the question would carry us beyond our limits. We must say a word, however, on the tics of idiots.

The study of tic as it occurs in idiots, imbeciles, and *arriérés*, has engrossed the attention of alienists since the days of Pinel and Esquirol. Cruchet says the mental state of the idiot and the imbecile is so characteristic that the diagnosis of convulsive tic in such cases is never attended with any difficulty. Yet the task is sometimes sufficiently delicate, for we maintain that upon our insight into the subject's mental condition depends our ability to analyse his tics.

Considerable light has been thrown on the question by the important information amassed by Bourneville, as well as by the fine psychological studies of Sollier and the meritorious thesis of Noir, from which we shall borrow largely in this place.

In the first instance, we meet with tics in every way comparable to those we have already described, and we may give one or two examples.

R. accidentally wounded his left eye at the age of eleven, and contracted a tic which consists in spasmodic blinking of the eyelids, though no sign of ocular lesion is left. A diminution in its intensity has been taking place, which has culminated recently in its spontaneous disappearance.

N. had an attack of ciliary blepharitis and keratitis which left an opaque patch on the upper and inner part of his left cornea, and he has blinked ever since. Yet there is no local irritation to justify the continuance of the movements.

The tics are occasionally as numerous and violent

as in Gilles de la Tourette's disease, and are accompanied with cries and with coprolalia.

L. is afflicted with abrupt blinking of the eyelids, retraction of the head, and elevation of the lip. Once the tic is established, it persists on an average for from eight days to a month, and during this time no effort on his part will check it. Sometimes he makes peculiar growling noises; sometimes he cannot prevent himself from stooping down as if to pick up stones; sometimes he is unable to restrain himself from touching everything within reach.

From the age of five, C. exhibited frequent blinking movements, and gestures which seemed to indicate that his clothes were uncomfortable. No attempt at modification was attended with success. The tics steadily increased, till he found himself uttering cries and letting obscene words escape his lips. For a long time they remained in abeyance, then reappeared in his face and trunk, in the form of salutation movements. His propensity for clastomania, pyromania, and kleptomania necessitates his being kept under strict supervision, and though he is intelligent and has a good memory, he is also lazy and inattentive.

Other tics of still greater complexity and peculiarity are met with among those whose psychical imperfections are very pronounced. Some "co-ordinated tics" are remarkable for their intricacy; they consist of a series of movements which mimic some act of everyday life. In this group may be specified various rhythmical movements, such as those of balancing, head rotation, and striking or beating oneself—the krouomania of Roubinowitch; they may be compared to the mother's rocking of her infant, inasmuch as they have a soothing effect on their subject, however brutal the movement itself sometimes may be.

In most cases the patient is seated and rocks himself to and fro in an antero-posterior direction. Or it may be the head only that is rhythmically moved from side to side, and the performance may go on indefinitely. A mere touch or a word, on the other hand, is commonly sufficient to interrupt its sequence.

There remains a final class of co-ordinated tics, which

Noir distinguishes by the epithet "large," tics which are confined to idiots of good physical development. They consist of a movement or series of movements of considerable amplitude, and constitute the predominant clinical feature of the patient's idiocy. Here we find subjects who jump, or climb, or turn round and round; in other cases they are reduced to the level of mere automata, and go through a long series of actions in a mechanical way.

Their memory for recent occurrences is very poor, but in their minds are stowed away vague souvenirs of events long past, which they translate into action, and which they are incapable of modifying, even as they are unable to add to their mental store or to alter their mental routine.

A classic instance of this variety of tic is Ros., long known at Bicêtre as "the waltzer."

## CHAPTER XV

### THE DISTINCTIVE FEATURES OF TIC

WE are scarcely inclined to believe in the possibility of condensing into an adequately concise and adequately precise formula our conception of tic, or at least all the notions which contribute to it. Because most authors feel it incumbent on them to fall in with this nosographical custom, definitions have been proposed whose brevity only serves to confuse the issue. Opinion on the interpretation of certain words which concern our subject is far from being unanimous, and, as we remarked at the outset, accuracy in our terminology is urgently called for. This has been our reason for preceding our definitions by the results of clinical observation and pathogenic analysis.

Our idea of tic, however, may be couched in the following terms:

*A tic is a co-ordinated purposive act, provoked in the first instance by some external cause or by an idea; repetition leads to its becoming habitual, and finally to its involuntary reproduction without cause and for no purpose, at the same time as its form, intensity, and frequency are exaggerated; it thus assumes the characters of a convulsive movement, inopportune and excessive; its execution is often preceded by an irresistible impulse, its suppression associated with malaise. The effect of distraction or of volitional effort is to diminish its activity; in*

*sleep it disappears. It occurs in predisposed individuals, who usually show other indications of mental instability.*[1]

We are in a position, now, to elaborate the details of this definition. Tic is a psycho-motor affection, and there are two inseparable elements in its constitution, a mental defect and a motor defect.

The prevailing mental defect is impairment of volition, which takes the form either of debility or of versatility of the will. This being characteristic of the mind of the child, its continuance in spite of years argues a partial arrest of psychical development. Hence the epithet infantile may be employed to qualify the patient's mental state.

Other psychical troubles, which similarly are anomalies of volition, may be superadded, in particular impulsions and obsessions.

Speaking generally, a certain degree of mental instability is a distinguishing feature of the patient with tic.

The defect of motility consists at first in the provocation of a motor reaction by some external cause, or by an idea.

In the former case, the reaction is the cortical response to a peripheral stimulus, and its logical execution becomes by dint of repetition habitual and automatic. With the disappearance of the stimulus it continues to manifest itself, without cause and for no purpose, in which circumstances the feebleness of the inhibitory power of the will is revealed.

In the latter case, the motor reaction is called into being under the influence of an idea, normal or pathological, which eventually ceases to operate, and by virtue of the same pathogenic mechanism the act remains, inopportune and exaggerated.

The objective manifestation of tic is a clonic or

[1] MEIGE, *Les tics*, July, 1905 (Masson).

tonic convulsive movement, an anomaly by excess of muscular contraction.

In the clonic variety there are undue rapidity and increased frequency of the movements.

In the tonic variety, the duration of the contraction is prolonged.

The intensity of the movements, likewise, is abnormal in degree.

In spite of these disfigurations, so to speak, of the original movement, it is practically always possible to detect in them co-ordination and purpose, the cause and the significance of which ought to become the object of our search.

The motor disorder can never be reduced to mere fibrillation, nor indeed to fascicular contraction unless in some one muscle different bundles have different physiological attributes. It is usual for several muscles to be concerned, and their anatomical nerve supply may be from separate sources.

Like ordinary functional motor acts, tics are distinguished by co-ordination of muscular contraction and repetition; they are preceded by a desire for their execution, and succeeded by a feeling of satisfaction.

These features, however, are carried to excess.

In addition, the functional act is inapposite, sometimes even harmful; it may be described as a parasite function.

The muscular contractions follow each other at irregular intervals; they come in attacks, which, it is true, are highly variable in frequency, duration, and degree.

Volition and attention exercise a restraining influence on the motor phenomena, but repression is accompanied by malaise, sometimes by actual anguish.

Distraction suspends the activity of tic; physical fatigue and emotion are calculated to arouse it.

Tics always disappear in sleep.

They are unaccompanied by any alteration in sensation, in the reflexes, or in the trophic functions.

They are not associated with pain.

In this general way we have indicated the distinctive features of tic, and we may take the opportunity to remind ourselves of their extreme variability.

In discussing the question of diagnosis, we shall have occasion to emphasise the importance of *fruste*, atypical, and transitional cases, not because we think they can be systematised as yet, but because they may be capable of new pathogenic interpretations which we cannot afford *a priori* to set aside.

We venture to believe that tic has a clinical individuality of its own which we have tried to portray, and we go so far as to say that an appreciation of the points we have touched on will prove of service in matters of diagnosis.

# CHAPTER XVI

## DIAGNOSIS

### TICS AND STEREOTYPED ACTS

WE have already, on more than one occasion, drawn attention to the phenomena known as stereotyped acts, demonstrating their intimate kinship with the tics and the frequent difficulty of establishing a differential diagnosis. To ensure precision of ideas and of terminology, we must restrict the expression to motor disturbances in which the characters of the muscular contraction are identical with those of normal acts. On this view many motor reactions are really classifiable as stereotyped acts, and among them are those denominated by Letulle "habit tics."

Stereotyped acts occur in normal individuals, and it may fairly be said there is no one but has his habitual gesture, his movement of predilection. As a matter of fact, a certain number of what Letulle calls co-ordinated tics belong to the group under consideration; others, no doubt, are genuine tics, and between the two may be found innumerable intermediate varieties.

From the diagnostic standpoint the stereotyped acts that occur in the course of mental disease, of which a conscientious study has recently been made by Cahen,[1] are highly instructive. He defines them as non-

[1] CAHEN, "Contribution à l'étude des stéréotypies," *Archives de neurologie*, 1901, p. 474.

convulsive, co-ordinated attitudes or movements, resembling intentional or professional acts, repeated at frequent intervals and always in the same fashion, till their conscious and voluntary performance is replaced by a degree of subconscious automatism. In the case of the insane they are secondary to some delusion, and persist though the latter may disappear. Hence the patient may be incapable of explaining his movements and attitudes, however much he may persevere in their automatic execution—an evolutionary process akin to that of the tics.

A typical instance may be quoted from Séglas:

B. passed under observation in 1891, suffering from delusions of persecution, and not long afterwards it was noticed that from time to time he used to come to a halt in the courtyard, gaze at the sun, and rotate his hands round an imaginary axis. The reply he vouchsafed to interrogation on this point was that he was effecting the sun's revolution. At present, however, he has sunk into a state of dementia, and while the gesture continues he is unable to furnish any explanation of it.

Of course it is inadmissible to apply the term to co-ordinated acts that are neither conscious nor voluntary, such as the teeth grinding of the general paralytic, or the body oscillation of the idiot. Similarly one must differentiate them from impulsive seizures, abrupt irresistible motor explosions neither frequent nor prolonged.

A distinction has been drawn between *akinetic* (attitude) stereotyped acts and *parakinetic* (movement) stereotyped acts. As instances of the former we may give the following:

A woman reclines continuously in bed because she believes she has an infernal machine in her abdomen.

Another patient sits on the ground all day long, buttoning and unbuttoning his clothes.

An old gymnast maintains while he stands a professional attitude in

which his head is raised, his right fist closed on his hip, his right leg crossed in front of the left, and his right foot elevated vertically.

Conditions such as these present the most intimate analogies to our attitude tics, though in the case of the latter there is always a more or less pronounced exaggeration of muscular contraction, a certain degree of tonic convulsion.

Parakinetic stereotyped acts are of common occurrence, and embrace every variety of movement or gesture.

A former acrobat leaps staircases, climbs railings, exercises his arms rhythmically and regularly, etc.

A patient promenades untiringly in the same corner and at the same pace.

An old engraver, now a dement, passes the day in reproducing in a more or less modified form certain actions associated with his former profession.

Alike in tics and in stereotyped acts, a time comes when the motor habit establishes itself, for no apparent reason or purpose; hence the co-existence of the two classes in chronic delusional insanity, in dementia precox, in catatonic states, in systematised mental disease of other forms, and in general paralysis.

Stereotyped acts may be the embodiment of ideas of persecution and of grandeur, or the outcome of mystical, hypochondriacal, and other states. A patient with delusions of persecution writhes because he is being "electrified." A hypochondriac rests motionless because he believes himself made of glass. A mystic maintains an attitude of genuflexion for hours at a time.

Obsessions also play a part in the genesis of the acts we have under consideration, but of all delusional ideas those of defence are the most fertile in this respect.

A patient under the care of A. Marie used to carry a

fragment of glass between his teeth and other pieces beneath the soles of his feet, the idea being that they formed insulating cushions whereby to protect himself from the electricity of his enemies.

The suggestion was thrown out by Bresler that the movements of tic are often of a defensive character—that the disease, in fact, is a sort of "defence neurosis" linked to hyperexcitability of psychomotor centres. This theory is not unlike the view of hysteria taken by Brener and Freud, and as the movements themselves are usually of the nature of mimicry, Bresler has proposed the term *mimische Krampfneurose.*

In some cases of mental torticollis, the attitude assumed may be considered as a stereotyped act. Martin has recorded an example of torticollis in relation to melancholia. Another of his patients suffered from rotation of the head to the left, a position which could easily be rectified by asking the man to make the sign of the cross. The moment he put his finger on his forehead the displacement of the head was corrected. If, however, he were requested to look straight in front of him, he remained incapable of altering the vicious attitude, the reason he advanced being that he could no longer see the sun.

One cannot but be struck with the remarkable analogies to the cases given by Cohen. And it is worth remembering further, that sometimes mental torticollis degenerates into actual dementia.

### TICS AND SPASMS

Nothing is more arduous, at first sight, than the differentiation of a tic from a spasm, the similarity of their external forms being a fertile source of confusion. Yet the establishment of a correct diagnosis is of prime importance, since in their case prognosis and treatment alike are diametrically opposed.

Tic is a psychical affection capable of being cured, if one can will to cure it: at the worst we may fail, but there is no idea that it is indicative of a grave organic lesion prejudicial to life. A spasm, on the contrary, though it appear in almost identical garb, is excited by a material lesion on which depends the degree of its gravity. The focus of disease may disappear, no doubt, but it is only too likely to persist and to occasion other disorders. Hence the desirability of making sure of one's diagnosis—a proceeding not necessarily of insuperable difficulty. If we apply the principles of diagnosis enunciated by Brissaud, to which our attention has already been directed, we shall not find the task beyond our powers.

Let us take a concrete instance.

Here is a cabman, forty-nine years of age, the left half of whose face is the seat of convulsive twitches. These commenced eighteen months ago by brief insignificant contractions of the left orbicularis palpebrarum, which have gradually spread to the whole of the muscular domain supplied by the left facial nerve. Their momentariness and rapidity, their apparent independence of extraneous stimuli, their indifference to treatment and resemblance to the twitches produced by electrical excitation, their occurrence in sleep, the fact of voluntary effort, of attention or distraction, serving so little to modify their range and intensity—all make clear the spasmodic nature of the condition.

The motor manifestation is the consequence of irritation at some point on a bulbo-spinal reflex arc; its abruptness and instantaneousness negative the possibility of recognising in it any sign of functional systematisation. It is not a co-ordinated act of a purposive nature, but a simple, unvarying, constant motor reaction to a particular stimulus. That its intensity should be in direct proportion to the intensity of the latter, changing from feeble contractions to a state of transient tetanus, is further proof of its spasmodic origin. When the excitation is at its maximum, there is sometimes involvement of the opposite side of the face, by virtue of the law of the generalisation of reflexes.

It is true there is no association of pain with his attacks, as in so-called tic douloureux, but the spasm is heralded by a tingling sensation below and to the inner side of the outer corner of the eye. This sensation, "like an electric battery," persists during the spasm and disappears in the intervals. Its occurrence suggests that the ascending

branch of the infraorbital nerve, springing from the trigeminal, is affected, and indeed pressure over its point of emergence evokes a certain amount of pain. Moreover, there is occasionally a flow of tears when the spasm is at its height. It may be difficult to decide whether this is the result of mechanical compression of the lachrymal gland or an exaggerated secretion of tears under the influence of stimulation of the lachrymo-palpebral twig of the orbital nerve. In any case the pathogeny of this facial spasm is entirely comparable to that of tic douloureux of the face, and it is quite within the bounds of possibility that a minute hæmorrhage—for the patient is of a very florid type—somewhere on the centrifugal path of the trigemino-facial reflex arc, may be giving rise to the phenomena.

What we wish to insist on, however, is the dissimilarity between this facial spasm and tic. In the movements we have been describing we fail to distinguish any purposive element, any co-ordination for the fulfilment of a particular function: they are not imitative in character, nor do they express any sentiment; no impulse precedes their execution, no satisfaction follows.

The patient's mental state presents no peculiarities, as far as we have been able to discover. There is no volitional debility or instability; if he cannot control the convulsions, it is to be remarked that he cannot control them even for a moment, whereas all sufferers from tic are capable of inhibiting it for a longer or shorter period by an effort of the will, by concentrating their attention on it.[1]

The following remarks on this case are due to Professor Joffroy:

If the patient be asked to open his mouth, the spasm of the left cheek remains in abeyance as long as it is open, but the platysma of the same side then begins to twitch spasmodically. Or if he be requested to shut his eyes, so long as they continue closed the cheek is quiescent; but, on the other hand, both orbiculares palpebrarum, as well as the pyramidal muscles and the adjacent fibres of the frontalis, are seen to contract irregularly. There is a sort of transference of spasm, and this is of peculiar interest, inasmuch as it affords evidence that the lesion is not so restricted as one might suppose.

The explanation no doubt is to be sought in the law of the diffusion of reflexes, confirming the diagnosis of an irritative lesion at some point on the trigemino-facial reflex arc.

[1] MEIGE, "Spasme facial franc," *Soc. de neur. de Paris*, April 17, 1902.

In the differential diagnosis of spasm assistance may be obtained by a consideration of the following points:

The extreme abruptness of the movement recalls the contractions produced by electrical stimulation.

There is no purposive or co-ordinated feature in the spasm, which is confined to some nerve area anatomically limited.

Volition, attention, distraction, emotion, all fail to effect any modification of the phenomena.

No irresistible impulse precedes their manifestation, nor is it succeeded by a feeling of satisfaction. Sometimes the spasm is accompanied by severe pain.

As a general rule the patient's mental state does not present the anomalies met with so frequently among those who tic.

Important information may be gleaned from a scrutiny of the condition during sleep. Should the convulsive movement persist, it may be said with confidence to be a spasm; whereas if it completely disappear, it is probably a tic. Whether a spasm may vanish in sleep, however, is another question, which clinical observation has not yet satisfactorily answered, and if no other indication of organic disease be forthcoming, the problem must in the present state of our knowledge be left unsolved.

### A. Tic or Spasm of the Face

In cases where the face is the seat of the convulsive movements this problem of diagnosis becomes one of the utmost nicety. That a distinction may be drawn, however, is universally admitted. Hallion,[1] for instance, specifically separates clonic spasms due to structural

[1] HALLION, "Convulsions localisées," *Traité de médecine*, vol. vi. p. 897.

changes from the "nervous movements" of neuroses such as chorea or tic. Facial spasm is rigorously limited to the distribution of the nerve, and is commonly the result of some alteration in it effected by causes similar to those that occasion facial paralysis.

Clonic spasms of the face are occasionally a sequel to local traumatism—that is to say, they are the result not of direct but of reflex excitation of the facial nerve. Tic douloureux belongs to this class. Tic non-douloureux also is sometimes merely a simple reflex spasm.

One of the most pregnant of Brissaud's lessons is devoted to the elucidation of this part of our subject, and we have already made several quotations from it. In many cases he is forced to say, "I decline to hazard a diagnosis when etiology is silent." We too have been face to face with this diagnostic difficulty on several occasions, and it may be instructive to give the details of one or two cases where no definite conclusion could be arrived at.

A man thirty-seven years of age had been suddenly seized with facial paralysis on the left side thirteen years before, accompanied after an interval of eight days by bilateral fronto-temporal cephalalgia, nausea, vomiting, and disturbances of vision. These attacks recurred irregularly during the next four years, since when they have ceased, although the palsy persists. Recently the patient woke up abruptly in the middle of the night to find that the left side of the face was in a state of spasmodic contraction, a condition which has continued absolutely without intermission. There is no pain in relation to the spasm, merely a peculiar sensation at the site of the muscular twitches. Of what nature are they?

If we analyse the muscular play somewhat more closely, we observe that with the exception of the frontalis all the muscles of the left face, including the platysma, contribute. On a background of more or less permanent contraction are outlined short, incomplete, greatly varying twitches, affecting one muscle after another, and sometimes only a few fibres, in a highly erratic way. The march of the movements obeys no law, either of space or time, nor is there any co-ordination in their activity. That the condition is one of tic, therefore, is scarcely conceivable. No purposive element is discoverable in the phenomena, no systematisation,

no expression of emotional excess. All is disorder, confusion contradiction.

We should, accordingly, be content to make a diagnosis of spasm, but an examination of the patient's mental condition must not be neglected, and in this particular case it is very instructive.

It appears that his imagination has always been singularly fertile, amounting indeed to eccentricity. The picturesque description he furnished of the unusual sensations in face and neck lent support to the view that his muscular activity was intended, consciously or unconsciously, to free himself from their insistence, so that his grimacing may have been but a gesture of defence.

But however much his lack of psychical equilibrium may favour the relegation of his affection to the category of tic, certain considerations make one question the validity of the hypothesis.

In the first place, it is rather an uncommon functional adaptation of the facial muscles to utilise them in an attempt to disembarrass oneself of disagreeable sensations ; and in the second it is no less uncommon for the sufferer from tic to be unable to restrain his muscles even momentarily, as our patient appears to be. The actual time of onset of the movements is significant enough, but of supreme importance is the fact of their supervention in an area previously the seat of paralysis. To our mind this is more than a coincidence ; from the history supplied by the patient it is plain that the paralysis was peripheral and that the lesion involved the facial trunk somewhere in its intracranial course after its emergence from the side of the pons. Thirteen years later, convulsive movements appear in the same domain. Taking all the circumstances into consideration, we think the hypothesis tenable that the trigeminal is implicated in the pathogeny of the spasm, although the condition is not strictly comparable to the classic tic douloureux.

The exact nature of the lesion is more difficult to determine. A review of the details of the facial palsy suggests its vascular origin, to which theory the headache, nausea, and photophobia of succeeding days and months—indicating, as they do, a circulatory disturbance in the basilar region—lend support. With the gradual restoration of vascular equilibrium the migrainous attacks lessened in frequency and severity, though the facial trunk remained compressed, till the spasm appeared, no less suddenly than had the paralysis. It is feasible that the former, too, is the derivative of a minute hæmorrhage irritating either the centrifugal or the centripetal arm of the facial reflex arc, probably the latter, which would explain the paræsthesiæ.

The possibility of this explanation being accurate is confirmed by a case reported by Schültz, where facial spasm of ten years' duration was shown at the autopsy to have been caused by an aneurism of the left vertebral artery impinging on the facial nerve in the neighbourhood of the basilar trunk.

The arguments, therefore, which plead in favour of the spasmodic nature of the condition seem to us so cogent that the hypothesis of tic must be rejected. We ought not to forget, on the other hand, that a spasm, of whatsoever origin, may be transformed into a tic by the perpetuation of a morbid habit.

Let us take a second case, no less instructive than the preceding.

Madame L. was sent to one of us by Professor Pierre Marie. She had always been nervous, impressionable, and high-spirited, but had never suffered from fits. At the age of eight years, during convalescence from one of the exanthemata, she got a chill, and the very next day developed an acutely painful torticollis, the head resting on the right shoulder and the chin touching the left clavicle. A complete cure ensued, but from that time a certain degree of facial asymmetry was remarked. At the age of eight and a half menstruation commenced, and it still continues, at the age of fifty-nine.

From youth she had at intervals been stricken with pains in the limbs, and with recurrent bilious attacks. Two years ago the death of her husband was the occasion of great mental strain and distress. Sixteen months ago she noticed a curious sensation in the right eye, not painful, accompanied from time to time by blinking of the lids. Very gradually the convulsive movements spread over the whole of the right face, and for the last month their frequency and intensity have been such that rest is an impossibility.

When she came under observation what impressed the mind first was the remarkable asymmetry of her figure: the right side of the face was smaller than the left, the right eye appeared to be at a lower level than the other, while the mouth was strongly deviated to the right and the chin twisted in the same direction. For a minute or two the facial contortion held sway, disappearing only to reappear quickly.

Not solely to the old torticollis was the facial asymmetry attributable, but also to the convulsive movements of the right half of the face. The effect of these was to close the right eye, deflect the nose to the same side, drag the mouth in a similar fashion, and wrinkle the skin of the chin and neck. Hence was evolved a unilateral grimace quite unlike any ordinary expression, resembling rather the facies in contracture secondary to facial paralysis.

During the next few months there was a gradual change from this tonic to a clonic stage, in which the movements were of less frequent occurrence, but more rapid. In repose there was no further indication

of the old facial palsy than the flattening of the facial lines on the right. Under the influence of any emotion, or any passing contrariety, or in the course of an animated conversation, or if circumstances call for their repression, the spasms increase in number and degree, whereas solitude and tranquillity favour their subsidence.

A recent development has been the discovery of a means of checking the spasm—viz. by compressing the larynx with the fingers of the two hands. Madame L. admits the illogical nature of the manœuvre, but extols its efficacy. As a matter of fact, it sometimes fails of its object.

How, then, is this localised convulsive movement to be designated? Is it a tic or is it a spasm?

The march of the disease, its painlessness, the absence of any reaction in sleep, the success of the little laryngeal trick, the inhibitory effect of the will, the definite influence of attention, distraction, in short of the psychical condition of the moment—all plead in favour of its classification in the former category. On the other hand, we cannot shut our eyes to the fact of the pre-existence of specific organic disease, and, moreover, the spasm is strictly confined to the anatomical distribution of the facial nerve. Even in periods of repose there is a certain amount of fibrillation on that side. On these counts are we to hazard the diagnosis of facial trophoneurosis?

A subsequent opportunity of examining the same patient served to confirm the diagnosis of spasm secondary to facial dystrophy, and treatment failed to make any impression on the condition.

Our object in giving these cases has been to point out the difficulties in the way of diagnosis, especially where spasm is superadded to a mental state that itself predisposes to tic. The wisest plan in many instances is to confine oneself to a description of the symptoms and to tabulate the arguments for and against a particular view, without perpetrating the error of committing oneself.

Many cases labelled convulsive tic might be quoted where the expression of so definite an opinion ought to have been reserved, as in one reported by Mayer[1] under the title of convulsive tic consecutive to infraorbital neuralgia:

A man, thirty-two years of age, had suffered from a severe infra-

[1] MAYER, *Alienist and Neurologist*, July, 1897.

orbital neuralgia of some weeks' duration, apparently attributable to a chill. The pains recurred at intervals till their substitution five years later for slight spasmodic twitches of the left eyelid, which gradually developed into violent convulsions of the whole of the left half of the face. These spasms were preceded by a sensation of numbness in the left ear, while during repose no modification of facial expression was to be remarked.

Further, there was a history of exactly similar neuralgia and spasm in the mother of the patient, although in her case the latter had been the first to appear, and had been replaced after a six years' interval by left facial neuralgia, which resection of the nerve failed to relieve.

In these cases the condition is undoubtedly one of painful facial spasm, inaccurately and unfortunately styled "tic douloureux."

Bruandet[1] has recorded a typical example of right facial hemispasm consequent on facial neuralgia, in which, however, no certain macroscopical or microscopical lesion was detected, in either cortex or bulb. But the mere fact that no structural alteration was discovered post-mortem cannot invalidate the diagnosis; the imperfection of our methods of investigation suffices to explain the negative results of such researches.

### B. Tic or Spasm of the Neck—Torticollis Tic and Torticollis Spasm

To make a diagnosis of torticollis, it is essential to satisfy oneself of the integrity of the bones, muscles, and articulations of the cervico-scapular region, previous to directing attention to the psychical state of the patient. In regard to the latter point, the question of heredity must not be neglected. If personal and hereditary defects are prominent, the presumption is in favour of mental torticollis; and if the convulsive

[1] BRUANDET, "Un cas d'hémispasme facial," *Rev. neurologique*, 1900, p. 658.

movements present the characters of tic, the diagnosis is practically certain.

In three cases under the observation of Fornaca,[1] for instance, there is no room for doubt. Not merely was there no sign of irritation from peripheral sources, but also no one of the three was psychically normal.

Nevertheless we frequently find ourselves confronted by the question: is the movement a tic, or is it a spasm? For, strictly speaking, there are both a torticollis tic and a torticollis spasm, and their separation one from the other is often a matter of the greatest perplexity.

We must refer the reader to the chapter devoted to mental torticollis for a consideration of the features of that condition, and we need not dwell on those cases of spasmodic torticollis that are obviously occasioned by irritative lesions of nervous centres or conductors. In this latter category may be placed the case put on record by Oppenheim, where torticollic spasms were produced by pressure of a cerebellar tumour on the cranial nerves.

But in the affection known as hyperkinesis of the accessory of Willis we have little doubt both tics and spasms have been included. Apart from the cases of spasmodic torticollis, so called, which Babinski has published and to which reference has already been made, we may be allowed to cite one or two more, in order to exemplify the differences of interpretation to which they are liable.

At the Congress of Toulouse two patients were shown by Desterac,[2] both of whom had suffered since the age of eight from a disease akin either to Friedreich's disease or to hereditary cerebellar ataxia.

[1] FORNACA, *Clinica medica italiana*, No. 11, 1901.

[2] DESTERAC, "Syndrome du torticolis spasmodique," VI^e *Congrès français de médecine*, Toulouse, April, 1902.

They presented the spastic gait of the former with the involuntary movements of the latter, in addition to spasm of the hand in writing, spasmodic movements of the trunk, and spasmodic torticollis. Both had club foot and scoliosis, and one was afflicted with spasm of the face and left arm. In his case, further, there was nystagmus, together with loss of reflexes and difficulty in articulation, while fibrillary contractions were to be observed in his muscles. The other patient's reflexes were exaggerated, and he showed a double extensor response.

In Desterac's opinion their spasmodic torticollis was dependent on this congenital constitutional affection, which might be regarded as a *fruste* form of one of the diseases above mentioned.

Through the kindness of M. Desterac the opportunity has been granted one of us of examining the two patients, and we should like to point out why we think his interpretation of their symptoms must be considered with reserve.

Speaking generally, we thought the cases closely resembled those in which a long-standing mental torticollis is accompanied with convulsive movements of the limbs. The scoliosis was not permanent, the deformation of the foot could be overcome, and at the same time we failed to convince ourselves of the presence of nystagmus and the absence of the knee-jerks. Moreover, we happened to observe one of the patients in the street unawares, and remarked how between two phases of bizarre contortions his vicious attitudes and convulsive gestures almost entirely vanished. In fact, the clinical picture seemed to us to be quite other than that associated with organic disease such as Friedreich's disease or hereditary cerebellar ataxia.

Another case recently brought before the Neurological Society of Paris by Marie and Guillain [1] serves even better to illustrate the intricacies of diagnosis.

[1] MARIE AND GUILLAIN, "Mouvements athétoïdes de nature indéterminée," *Soc. de neur. de Paris*, April, 1902.

The patient was a man of fifty-eight, who for years had exhibited certain movements apparently of an athetoid nature. His head was extended and rotated to the right synchronously with elevation and eversion of the left shoulder, then it passed into flexion. Except for a few odd movements of the tongue, the face conserved immobility. In the arms the localisation of the contractions was mostly proximal, though there were alternating flexion and extension movements of the fingers which suggested athetosis. Flexion, inversion, and adduction of the thighs also occurred. The recti abdominis were similarly involved.

Under the influence of emotion the movements were increased, but they could not be inhibited by an effort of attention. Their rate was too slow for chorea. Ordinary voluntary movements were performed without apparent trouble; the patient was able to dress himself, and to drink without spilling the liquid. Diminution of the knee-jerks was noticed, with what seemed to be an extensor response. Slight scoliosis of the vertebral column and a misshapen right foot recalled Friedreich's ataxia. There was nothing to justify a diagnosis of hysteria.

This curious condition dated from the year 1874, when the patient had a febrile attack, in the course of which pain and tingling appeared in the toes of the right foot, followed by involuntary movements of the same member. Analogous symptoms were not long in appearing in the left arm. Two months later the condition had become general, but from that time no special modification took place.

In the subsequent discussion it was remarked by Souques that the case resembled one recorded by Chauffard[1] as Friedreich's disease with athetotic attitudes, where the patient was a child with club foot, diminution of the knee-jerks, and generalised athetotic movements.

Notwithstanding our inability to assign a definite nosographical position to examples of this kind, we think it desirable to make some reference to them, in the hope that further observations will aid in their diagnosis. They at least remind us that convulsions occurring in the course of organic disease may be simulated by the manifestations of certain motor neuroses.

[1] CHAUFFARD, "Maladie de Friedreich avec attitudes athétoïdes," *Semaine médicale*, 1893, p. 409.

## TICS AND CHOREAS

### A. Sydenham's Chorea

It would be difficult to find a better description of chorea minor than that given originally by Sydenham himself:

> The dance of Saint Guy, chorea Sancti Viti in Latin, is a sort of convulsion whose incidence is greatest, in both sexes, between the age of ten and puberty. Its onset is characterised by weakness of one limb, which the patient drags behind him, and soon the arm of the same side is affected in the same way. He finds it impossible to maintain the same position of the arm for two consecutive moments, however great be his efforts to attain this object. Before he can bring a full glass to his lips he makes innumerable gestures and antics, as the convulsive moments of the limb deviate it from one side to the other, until at length he has piloted the glass opposite his mouth, when he empties it at a gulp.

If we were to confine ourselves to this description by Sydenham, which so far as typical cases of the disease are concerned is perfectly accurate, differentiation between tic and chorea would not be a matter of any complexity. Unfortunately, however, the varieties of this form of chorea are legion, and in practice one constantly meets with conditions suggesting alike the gesticulations of chorea and the convulsive reactions of tic. Moreover, it has been pointed out by Oddo [1] that the fact of the habitual exaggeration of tic during the very years when chorea is liable to appear is calculated to confuse the issue.

He has attempted, however, to specify certain factors in the differential diagnosis. In the first instance, the form of the movements is of significance: there is no

[1] Oddo, "Le diagnostic différentiel de la maladie des tics et de la chorée de Sydenham," *Presse médicale*, September 30, 1899.

co-ordination in the muscular play of the choreic; it is amorphous, indefinable, and erratic, whereas the gestures of tic are purposive, and may be said to have a shape. One never sees in chorea a succession of similar movements, but though a patient be suffering from several tics, each of them is reproduced always in the same fashion. Unilaterality of distribution is more common in chorea than in tic; in other words, chorea, more or less, follows anatomical lines in the regions it affects, whereas the incidence of tic is physiological.

Both are arhythmic in their manifestation; nevertheless the repetition of tic is noteworthy for its regularity as compared with the changing mode and rate of the other. Noir emphasises the diagnostic value of its frequency, abruptness, and reiteration of identical movements. In a majority of cases the interference of the will is futile as far as chorea is concerned, while the victim to tic is usually capable of restraining his muscular activity at least for a space. The choreic exhibits his movements in public, but the *tiqueur* seeks the seclusion of his own room. The association of tic with obsessional ideas is frequently encountered, but there is no similar connection between obsessions and chorea. In addition, the myasthenia, pains, and alterations in the reflexes that often characterise chorea are awanting in the other affection.

It cannot be gainsaid, however, that the frequency with which atypical varieties of chorea occur is inimical to a ready diagnosis, and the onerous nature of the task is not lessened by the circumstance that many choreics are the offspring of neuropathic parents and reveal psychical anomalies comparable to those of the subjects of tic.

In a disease such as variable chorea, which has features in common both with tic and with chorea properly so called, the problem of diagnosis is still more

complicated, though excellent hints for its solution have been furnished by Brissaud.[1]

However frequently and warmly the theory of the origin of chorea in a neuropathic predisposition was advocated by Charcot, the fact of its usual evolution consecutive to some toxic or infective process is no less certain. Its incidence is greatest in children and the adolescent ; it runs a regular course of increase and decrease ; and the circumstances which cause the symptoms to vary during this cycle are never sufficiently potent to bring about even transitory suppression of them.

It is true that changes in the intensity of the symptoms seem to confer a remittent character on the affection, but there is nothing at all comparable to the sudden and unexpected waxing and waning of the form of chorea at present under consideration. None of the pathological attributes just mentioned concerns variable chorea, which, in addition, differs from Sydenham's chorea in two points—the multiplicity of the types of movement, and the fact that the patient can voluntarily check his involuntary actions. For these reasons, assimilation of the two clinical varieties is impossible, and the confusion of the two in practice need never occur.

A form of chorea entitled "habit spasm" by Gowers, and "habit chorea" by Weir Mitchell, has been the subject of further study by Sinkler,[2] but in all probability the cases of this description reported are instances of the variable chorea of Brissaud.

### B. Huntington's Chorea

In spite of the preponderating etiological significance of heredity and the constancy of psychical imperfections in the chronic chorea of Huntington, its confusion with tic is not at all likely to occur. Difficulties might arise in distinguishing chorea major from variable chorea, however, and here we have the views of Brissaud to help us.

[1] BRISSAUD, "La chorée variable des dégénérés," *Rev. neur.*, 1896, p. 417.

[2] SINKLER, "Habit Chorea," *Amer. Journ. of the Med. Sciences*, May, 1897, p. 559.

True chronic chorea is an incurable neurosis, of life-long duration. We have no trouble in pronouncing a diagnosis of chronic chorea if the symptoms date back five, ten, or twenty years, but they must have had a commencement, and the whole problem is to foretell the course of a chorea as yet only a few weeks or months old.

The involuntary movements of chronic chorea, like those of Sydenham's chorea, are illogical, but they are combined in a co-ordinate manner—that is to say, certain functionally associated muscular groups act simultaneously as for a particular end : the patient shrugs his shoulders, closes his fists, cracks his fingers, utters cries, he swallows, sniffs, sucks in his breath, makes the sound of kissing, etc., in all of which actions orderly participation of the musculature in a foreordained way is evident. Slight twitching of individual muscles and parts of muscles also occurs.

There is no limitation of the movements to a special division of the body ; on the contrary, they spread from one muscle to another, and from one segment to another, rapidly and arhythmically. The gait is by turns skipping, dancing, or stumbling, interrupted by falls or by abrupt jerks of the loins. Speech is uncertain or monotonous ; writing is incorrect and badly formed, sometimes illegible. A fact of the utmost importance is that all these involuntary movements may be modified, abated, relieved, so to speak, by voluntary movements in an inverse direction. In some cases the power of willing is still sufficiently developed to permit of the patient's following his occupation.

The steadily progressing increase in the seriousness of the motor trouble, paralleled by progressing mental deterioration, is one of the most significant factors in the differential diagnosis. It is precisely the variability of the symptoms that distinguishes variable chorea.

### C. Hysterical Chorea

The conditions to which the name of hysterical chorea is applied may assume two forms, the commoner being known as rhythmical chorea, the other as arhythmical chorea. In the former case the convulsive movements are usually unilateral, being confined sometimes to a single limb, and reproducing, for instance, the actions of dancing (saltatory chorea), or of swimming (natatory chorea), or such professional movements as those of the blacksmith (*chorée malléatoire*). Occasionally

there is a more or less faithful reproduction of deliberate and purposive acts in the form of attacks of varying duration, recurring, moreover—and this is their cardinal feature—at equal intervals.

Under the title of disease of the tics two cases have been published by Nonne,[1] the first consisting of rhythmical twitches in a man of forty years, secondary to a head injury, the other presenting similar appearances, but concerning a young girl of eighteen years who had sustained a shock. In neither was there any sign of hysteria. The reporter animadverts on the designation "rhythmical chorea," and protests that the systematisation and co-ordination of the movements are very different from the clinical picture of Sydenham's chorea, while their rhythmical nature does not allow of their being classified as tic.

Sometimes hysterical chorea is arhythmical—that is to say, the movements are irregular and contradictory, as in ordinary chorea. True chorea in cases of hysteria comes under this heading, as well as those cases where hysterical patients imitate the movements of chorea. The presence of the distinctive characters of hysteria makes a diagnosis of tic improbable.

The separation of hysterical from variable chorea may be peculiarly perplexing, as in one of Brissaud's cases, where the patient's extraordinary mental instability was such as is encountered only in advanced hysteria, while her disorders of motility were highly characteristic of what is known as variable chorea.

The condition described as chorea gravidarum may be placed at one time in the category of hysterical chorea, at another in that of ordinary chorea. In it there is intense motor restlessness, and accompanying mental symptoms are not awanting in a majority of instances.

[1] NONNE, "Zwei Fälle von 'Maladie des Tics,'" *Neurolog. Centralbl.*, 1898, p. 327.

### D. Electric Chorea, Bergeron's Chorea, Dubini's Chorea, Fibrillary Chorea of Morvan

To render the study complete, we may remind ourselves of those still imperfectly differentiated forms known as electric chorea (Hénoch-Bergeron) and Dubini's chorea.

Bergeron's chorea affects children chiefly, and is characterised by the suddenness of its onset and the rapidity with which it attains its maximum. The movements are abrupt and brief, as though produced by an electric discharge at regular intervals, but their intensity does not hinder the execution of voluntary acts. They are sometimes confined to the head and limbs, most commonly they are generalised, and during sleep they disappear.

In the opinion of many, Bergeron's chorea is secondary to gastric disturbance. A cure may be regarded as certain, and indeed frequently follows the administration of an emetic. Sometimes the effect of the latter seems to be purely psychical.

Pitres thinks that this condition, as well as the electrolepsy of Tordeus, is simply a manifestation of infantile hysteria. According to Noir, there is an affinity between tic and electric chorea, and Ricklin is inclined to consider the two identical, but further study of the question is desirable.

Dubini's chorea is ushered in by pains and aches in the region of the head, neck, and sometimes the loins, and these are succeeded by electric-like twitches in the segment of a limb, which quickly become general. Severe convulsive attacks also occur, without loss of consciousness, entailing actual paresis of the limbs. The duration of the disease may be days or months, and 90 per cent. of the cases have a fatal issue. Confusion with tic is impossible.

We need not concern ourselves with so-called paralytic chorea, or with the fibrillary chorea of Morvan, which is a disease of adolescence, characterised by fibrillary contractions in the calves and thighs, passing thence to the trunk muscles and even to the arms; the face and neck, however, are spared, and during voluntary movement the fibrillation vanishes. Probably it is merely a variety of the paramyoclonus of Friedreich.

### TIC AND PARAMYOCLONUS MULTIPLEX—TIC AND MYOCLONUS

It is not our intention here to seek to provide a differential diagnosis between tic and the various conditions usually classed as myoclonus, and that for two reasons: in the first place, we cannot admit that the latter form a distinct clinical or nosographical entity, since the term myoclonus seems simply to be an abbreviation for clonic muscular convulsion, and is a symptom rather than a clinical syndrome; secondly, the fact that the tics themselves have been incorporated with myoclonus involves the investigation of all the published cases with a view to their critical sifting. This task we have pursued for our own edification, but to enter on it here would serve no useful purpose, and we shall rest content with examining succinctly several recent cases described as myoclonus, in the hope that the prosecution of further research will introduce order into what is at present chaos.

Among the various forms of myoclonus there is one which presents a certain individuality, and which was described originally by Friedreich under the name of paramyoclonus multiplex.

This disturbance of motility supervenes, in patients

with a neuropathic heredity, after some psychical accident such as a sudden fright or emotion, and consists in clonic muscular convulsions affecting the body generally, with the exception of the face. The contractions appear without obvious cause in one or in several muscles, are instantaneous, involuntary, and usually bilateral, but their most important feature is their inequality and irregularity. They may or may not effect displacement of the limbs; in any case they compose neither gesture nor gesticulation. Volition occasionally seems to have some transient inhibitory influence over them; they are exaggerated by cold and by emotion, and usually disappear in sleep.

It is obvious that this account of a typical case precludes the possibility of any confusion with tic, but the published cases are not always in conformity with it.

In 1892 Lemoine[1] reported a case where the movements of paramyoclonus multiplex were accompanied with echolalia and psychical changes. Raymond quotes an instance of the disease being preceded by facial tic, and another associated with tremor and choreic movements.

D'Allocco[2] has recorded twenty-four cases of differing forms of myoclonus, of which nineteen occurred as a family disease, in conjunction with stigmata of degeneration, epilepsy, and hysteria.

In a patient, aged twenty-six, suffering from general paralysis, Hermann[3] noted the presence of abrupt, irregular, myoclonic twitches in the sternomastoids, recti abdominis, adductors, and in some of the toes and

[1] LEMOINE, "Note sur un cas de paramyoclonus multiplex suivi des troubles psychiques et de l'écholalie," *Rev. de médecine*, 1892, p. 882.

[2] D'ALLOCCO, "Parecchi casi di mioclonia, la maggior parte familiari," *Riforma medica*, vol. i. 1897, p. 223.

[3] HERMANN, "Myoklonische Zuckungen bei progressiver Paralyse," *Neurolog. Centralbl.*, June 1, 1901, p. 498.

fingers, first on one side and then on the other, also in both legs, and subsequently in both arms, the face being unaffected.

Jancowicz considers diagnosis possible only in typical cases, and expresses the opinion that paramyoclonus is a syndrome common to many affections. Further, Schupfer makes the perfectly justifiable remark that under this denomination have been included cases of chorea, tic, hysteria, and rhythmic spasm; others have been secondary to organic disease of the cerebrospinal axis, such as rolandic lesions, spinal muscular atrophy, chronic poliomyelitis, syringomyelia. Others, again, depend on one or other of the psychoses, others on infective conditions such as malaria, diphtheria, typhoid, or on intoxications such as uræmia, mercurialism, or lead poisoning. Only a few recorded cases cannot be attributed to any of the conditions enumerated above, hence Schupfer's objection to the promiscuous classification of them all as paramyoclonus multiplex is quite warranted, in the absence of a uniform etiology and symptomatology.

Schultze[1] has suggested the term monoclonus for the tics, and he distinguishes monoclonus, polyclonus, and paraclonus. Embraced in the last of these is the paramyoclonus of Friedreich, which, according to Schultze, is usually unilateral, voluntary action diminishing the intensity of the involuntary movements, whereas the converse is the case in tic or monoclonus. Mixed forms are met with, however, and Schultze himself mentions one in which the movements were bilateral and increased with voluntary activity.

Heldenberg[2] applies the term intermittent functional

[1] SCHULTZE, "Ueber Chorea, Poly- und Monoklonie," *Neurolog. Centralbl.*, 1897, p. 611.

[2] HELDENBERG, "Myoclonus fonctionnel intermittent," *Semaine médicale*, 1899, p. 194.

myoclonus to twitches occurring from time to time in antagonistic muscles during voluntary movement, twitches exaggerated by excitement and diminished with rest. They occur in combination with well-marked vasomotor phenomena.

The myokymia of Kny and Schultze is characterised by fibrillation, pain, hyperidrosis, and changes in electrical excitability.

A case which seemed to be a combination of paramyoclonus with Thomsen's disease has been reported by Hajos [1] under the title myospasmia spinalis.

There cannot possibly be any hesitation in arriving at a diagnosis between tonic tic and Thomsen's disease, a condition consisting in slowness of relaxation of a strongly contracted muscle, and conceivably due to defective metabolism or organic change in muscular tissue.[2]

Examples such as the above, culled at random from an abundant medical literature, and variously entitled, will serve to demonstrate the protean nature of what the medical world is content to call myoclonus, and if from this collection of motor disorders we may hope to extricate the tics, there will remain still no inconsiderable labour of differentiation for the student.

### TIC AND ATHETOSIS

The athetotic movements that may accompany hemiplegia are scarcely likely to be confused with those of tic, but difficulties may arise where the athetosis is double.

It has been universally remarked that athetotic

[1] HAJOS, "Ein Fall von Myospasmia Spinalis," *Ungar. med. Presse*, 1898, No. 34.

[2] BECHTEREW, "Myotonie eine Krankheit des Stoffwechsels," *Neurolog. Centralbl.*, 1900, p. 98.

movements of the face reproduce the expression of emotions, such as admiration, astonishment, sorrow, gaiety, etc. Of course the same may be said of the grimaces of chorea; the latter, however, are usually more abrupt and pass less readily one into the other. The gesticulations of athetosis are undulatory, so to speak, and their excess leads to deformities principally in the direction of forced extension. The musculature is often rigid, and the reflexes are increased in activity. Sometimes there is a considerable degree of mental disturbance.

Now, it is precisely in cases where mental deterioration is a prominent feature that "nervous movements" have been described resembling those of athetosis, for which the term pseudo-athetosis has been coined. Two examples may be quoted from Noir.

E. is a girl of eleven years. Her expression is grimacing; her tongue is often protruded, but never bitten; her head is regularly flexed or extended, or rotated rhythmically to left or right. The arms are moved spasmodically at shoulder and elbow, while the hands are the seat of athetotic movements. She walks curiously, throwing her feet out in advance without bending her knees. She has a silly smile, and her mouth almost invariably hangs open. On request she can keep her hands quite steady, but one observes at once the effort this entails in the sudden seriousness of her expression. The ordinary acts of every-day life are performed satisfactorily enough: she can dress and undress, use a knife and fork, thread a needle, sew, etc.

J. is eleven years old also. She puckers her lips, contracts her eyebrows, elevates her alæ nasi; at the same time she exhibits pseudo-athetotic movements of her fingers which are entirely under voluntary control.

The question may indeed be asked whether pseudo-athetosis and variable chorea are not really identical. Further, all sorts of combinations of athetosis and myotonia have been noted,[1] but more light must be

[1] KAISER, "Myotonische Störungen bei Athetose," *Neurolog. Centralbl.*, 1897, p. 674.

shed on the subject before any further classification can be attempted.

The following case has recently been published by Marina[1]:

A blacksmith, aged seventeen years, already treated three times for recurrent chorea, suffered from slow contractions of the shoulder muscles, involving the elevators and internal and external rotators successively, and accompanied by movements of the head and arm, and by twitches of the quadriceps. Nothing seemed to have any influence over these movements except sleep. The faradic excitability of the shoulder muscles was augmented, the galvanic excitability diminished. Application of the constant current to the head and back sufficed to effect a cure in three weeks.

Marina proposes the term athetotic myospasm for these incessant slow alternating contractions, impulsive myospasm being employed to signify convulsive movements of more than one muscular group, purposive yet irresistible, as in tic and chorea major. Simple myospasm consists of single twitches in individual muscles, recalling those produced by electrical excitation. If several muscles are implicated, the condition is one of multiple myospasm or myoclonus.

### TICS AND TREMORS

All tremors, whether they occur during muscular repose or muscular activity, are distinguished by the relative restriction of their range and the regularity of their time. The tremors of paralysis agitans, disseminated sclerosis, senility, toxæmia, hysteria, exophthalmic goitre, etc., are not liable to be mistaken for tic.

It is true, of course, that tremor is sometimes combined with choreiform or athetotic movements in

[1] MARINA, "Delle miospasie in generale e della miospasia atetosica in particolare," *Il policlinico*, 1902, p. 577.

patients with psychical stigmata.[1] A proposal, too, has been made to unite hereditary and functional tremor and to describe them as a tremor neurosis.[2]

However simple be the diagnosis between tremor and tic, it is worth while to note in passing the etiology they may have in common. In a case recorded by van Gehuchten an intention tremor of the right arm co-existed with a tic of the right sternomastoid.

A sudden twitch of the whole body Letulle particularises as a "tic of starting," and Noir too thinks that a start of this nature may constitute a tic, but we are inclined to consider it a generalised reflex.

### TICS AND PROFESSIONAL CRAMPS

We have already had occasion to enlarge on the distinguishing features of professional or occupation cramps, spasms, or neuroses. Writers, pianists, violinists, flutists, dressmakers, telegraphists, watchmakers, milkers, knackers, blacksmiths, shoemakers, tailors, dancers, embroiderers, barbers, etc., etc., are all liable to suffer from occupation cramps. In every case the condition is one of inability to perform the professional movement, and that alone.

Grasset proposes to separate intra-professional from post-professional spasm, the former consisting in the impossibility of making the necessary professional movements, the latter in the involuntary over-reproduction of the familiar act. Properly speaking, the post-professional spasm is a tic.

We need not do more than remind the reader of the close affinities we have already seen to exist between

[1] LABBÉ, *Presse médicale*, 1897, p. 185; MILLS, *Journ. of Nervous and Mental Disease*, 1879, p. 504.

[2] ACHARD AND SOUPAULT, "Tremblement héréditaire et tremblement sénil," *Gazette hebdomadaire*, 1897, p. 373.

tics and professional cramps, and of the mental instability which both classes of patient present.

L. supplies an instance of variable hemichorea followed by writers' cramp and later by mental torticollis.

When L. was eight years old choreiform movements of the right arm began to appear, and soon rendered writing an impossibility. The disease continued for so long a time that one might not unreasonably expect to find considerable actual impairment of her caligraphy. As a matter of fact, it is scarcely affected : the patient can make her letters correctly, but after each letter she lifts her pen to allow her fingers to perform an abrupt movement, then she proceeds.

It cannot therefore be considered a true writers' cramp, but when she had learnt to write with the other hand it was not long ere that became the seat of a genuine cramp. The moment she attempted to make the pen move over the paper her grasp of it tightened and her fingers stiffened ; her wrist would no longer answer her. To obviate the trouble she used a pencil, at first with complete success ; but the cramp occurred afresh, and she gave up writing altogether. Prolonged holidaying, however, and respite from the exercise, had a salutary effect, and to-day there is no trace of former mischief.

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# CHAPTER XVII

## PROGNOSIS

THE prognosis in a case of tic depends solely on the mental state of the patient. After what has been said of the rôle played by psychical disorders in the genesis of tic, we can readily comprehend the reason for this. The intensity and tenacity of any tic are determined by the degree of volitional imperfection to which its subject has sunk. He who can will can effect a cure; be it a simple tic, or be it a case of Gilles de la Tourette's disease, if he can struggle long and energetically, the tic's doom is sealed. Permanent cures have undoubtedly been obtained, but they are the exception. Left to himself, the victim to tic can seldom escape from it.

As far as life is concerned, tics are harmless, yet, according to Gilles de la Tourette, the prognosis is by no means always unchanging.

> The establishment of a tic is never followed by its ultimate disappearance; it may be modified in all sorts of ways, yet the expert observer will not fail to mark its presence. A complete cure is not to be expected, for however much paroxysms may be alleviated and their frequency reduced, the morbid condition has become a sort of function, a product of the patient's mental constitution.

The statement may be taken to imply that no tic abandoned to itself ever vanishes completely, but the generalisation is inaccurate. Systematic treatment may

lead not only to amelioration, but also to cure. Certain tics of children are by nature ephemeral, and disappear spontaneously, never to return. It is easy to understand how that may be. Psychical evolution and physical evolution alike are liable to singular variations. Hence the development of a tic in early life is no reason for despair, seeing that we are not justified in the assumption that the volitional debility which it proclaims is to persist. We must believe that volition may be reinforced, and we must further the attainment of this end by every means at our disposal. Negligence on our part is highly culpable.

Tics of childhood are curable: we draw attention to the fact afresh. Their spontaneous dissolution is not unknown, but parents must not consider the question merely one of time. They must impress on their children the sobering effect of good behaviour and decorum. Discipline of this kind may be a long and delicate task, but to condone indulgence in untimely movements, on the pretext that they are merely quaint, is a mistake fraught with the gravest consequences.

When a child holds its knife or fork incorrectly, or puts its elbows on the table, or its finger in its nose, we feel that the habit is displeasing; but how much more serious the outlook if the trick consists in biting the lips, or tossing the head, or blinking the eyes! The former is an offence against good taste; the latter is a tic in embryo.

It may be said, as a general rule, that the chances of spontaneous cure are in inverse proportion to the age of the patient and the duration of his tic.

Tics of adult life may also be cured, less often, it is true, than in the case of children. Oppenheim gives the history of a woman with a rebellious facial tic of twelve years' duration, which ceased on the occasion of a certain happy event in the family life. Of course

one wants to know whether it ever returned, for many so-called cures are simply remissions.

T. had suffered from torticollis for a whole year, but on the eve of her son's marriage it stopped entirely for three days, and she deemed the cure permanent; it was not long, unfortunately, ere she underwent a relapse.

Brissaud[1] quotes an instructive case of temporary cessation of tic. A patient afflicted with mental torticollis of three years' standing learned that his son had been injured and had been removed to hospital to undergo an operation. In an instant his torticollis disappeared, but a reassuring report from the surgeon a few days later was followed by a recrudescence of the condition.

It is true a hardened *tiqueur* may be relieved of his tic, but the potentiality remains. He is still at the mercy of the impulse to tic, should it arise. Cruchet gives the history of a young man who suffered in succession from convulsive movements of negation, facial tic, blinking of the eyes, abrupt yawning, and twitches of the shoulder—all in the space of two years. Each disappeared in its turn, independently of treatment, without leaving any trace behind. In cases of this description a new tic is ever imminent. The facility with which one tic replaces another is a matter of common observation. We have often had occasion to observe relapses, or partial relapses, in which an altogether new tic suddenly makes its appearance on the top of one which has either been improving or has actually been checked.

Apart, however, from obdurate forms of long standing, especially such as are accompanied by signs of grave mental defect, we maintain that the subjection

[1] BRISSAUD, "Contre le traitement chirurgical du torticolis mental," *Rev. neurologique*, 1897, p. 34.

of patients to appropriate treatment for an adequate period has a favourable influence on prognosis. The curability of tic was denied by Oddo, but he has recently seen fit to change his opinion, and to confine his pessimistic views to Gilles de la Tourette's disease.

The prognosis of the mental state of victims to tic is outwith our province: it is a topic long since handled by psychiatrists. We may ask, however, whether any particular prognostic import is to be attached to the tics themselves.

In cases of Gilles de la Tourette's disease the progressive unfolding of motor disorders suggests a corresponding evolution of psychical derangements which may end in dementia. Brissaud warns us that in cases of mental torticollis we must be on our guard against the apparition of some much more redoubtable affection than the torticollis, for that, sometimes, is an incident in the prodromal stage of general paralysis of the insane. Séglas has had a case of ærophagic tic which eventually became one of general paralysis, and a similar instance occurred in the practice of one of us.

Not long ago Dufour[1] advanced the opinion that the occurrence of a motor syndrome consisting of the automatic movements of tic, in a case of delusional insanity, heightens the gravity of the prognosis as regards chronicity. It had been already remarked by Morel that such of the insane as contract tics usually degenerate into dements. Most of the contributors to the study of idiocy have noted the relation between the degree of intellectual debility and the extent of the automatic and rhythmical movements.

In this connection Joffroy has made some interesting statements.

[1] DUFOUR, "A propos des tics et troubles moteurs chez les délirants chroniques," *Soc. de neur. de Paris*, November 7, 1901.

Sometimes there is not merely co-existence, but an actual parallelism between the motor and the psychical disturbance. I have under observation at present a young woman suffering from attacks of agitation, with delusions and hallucinations, who has developed a facial tic in the course of her psychosis, and increase in the violence of the tic is associated with abrupt utterance of imperfectly formed syllables. During the last two months she has been having attacks in the evening, when the psychical troubles have become more intense, and simultaneously there has been aggravation of the tic and incessant emission of laryngeal sounds and syllables. Here then is a parallelism between the two groups of symptoms.

I am disposed, however, to believe that the usual prognosis given where motor and mental defects coexist is too guarded. I have seen the catatonia of dementia præcox disappear spontaneously, in spite of its intensity and the unfavourable outlook prophesied by all who had seen the case.

In distinction, then, from the value of a knowledge of the patient's mental condition, we consider the motor reactions of tic of little prognostic significance.

# CHAPTER XVIII

## THE TREATMENT OF TICS

### THE CURABILITY OF TICS

TICS are commonly held to be trivial affections of but passing medical interest, while in addition they have gained the notoriety of being peculiarly rebellious to treatment. Such undeserved criticism is at once too superficial and too severe. As far as life is concerned, the prognosis is favourable, but they often contrive, quite as forcibly as many graver diseases, to render existence intolerable. To neglect them or to consider them *a priori* incurable is entirely unwarranted. Some degree of amelioration is practically always attainable, and even complete cures may be effected.

It is an old doctrine this of the incurability of tic, but the sufferers have not always been left to their fate. Forecasts of methods of treatment likely to ensure success were made long ago. In the "Dictionary in Sixty Volumes" of the year 1821 will be found a definition of tic, a little out of date perhaps, but affording a glimpse of therapeutic possibilities: "The word tic is ordinarily employed to designate certain unnatural habits, bizarre attitudes, peculiar gestures, etc., whose correction demands a painstaking perseverance that is not always sufficient to procure the desired result."

Trousseau later introduced an element of precision

into current therapeutic measures by the application of a sort of gymnastic exercise to the muscles involved. He declared his opinion, however, that the arrest of one tic would soon be followed by the development of a second, which would in turn give place to a third, and so on; for the disease was essentially chronic, and in a sense formed part of the constitution of its subject. Subsequent observation has frequently borne witness to the truth of this remark, though the expression is too absolute.

For the majority of the older writers, nevertheless, the incurability of tic was axiomatic.

Pujol held non-dolorous facial tic to be most intractable. In the hands of Duchenne of Boulogne faradisation of the muscles was followed by only transient improvement. Axenfeld considered idiopathic facial convulsions hopeless from the point of view of treatment.

It has been remarked already that many of the earlier observers failed to discriminate between tic and spasm. In the article "Face" in the Encyclopædic Dictionary, for instance, Troisier includes every sort of facial movement under the term "convulsive tic," among them reflex spasms from dental caries or buccal ulceration, and muscular contractions occasioned by peripheral or nuclear irritation. His opinions as to the curability or otherwise of these movements are sufficiently dogmatic: "Convulsive tic is not a serious condition, yet it is in a majority of cases incurable and as a consequence most distressing. One can hope for success only if the tic is of reflex origin, where extraction of a tooth, or local treatment of an ulcer, or resection of part of the trigeminal nerve may be indicated."

Here the confusion is obvious.

Gilles de la Tourette's description of the disease

known as convulsive tic accompanied with echolalia and coprolalia is couched in equally pessimistic terms.

"It is no menace to existence, and the patient may well attain a ripe old age, but in revenge he stands very little chance of escaping from it. A radical cure is yet to be found. Isolation, hydrotherapeutics, electricity, and constitutional treatment cannot do much more than retard its evolution."

In Guinon's article on convulsive tic in the Encyclopædic Dictionary of the Medical Sciences of 1887 thirty pages were devoted to description and the following few lines to treatment:

> This chapter will of necessity be brief. . . . In presence of this affection the physician is unfortunately helpless. During exacerbations any nerve sedative may be tried. In severe cases or if the symptoms become aggravated, the sole treatment likely to be accompanied by improvement, scarcely by success, is a combination of hydrotherapeutics with isolation."

Nor is Charcot much more encouraging[1]:

> We cannot say that cure is certain, but we may count on longer or shorter intervals of arrest, either spontaneous or as a sequel to the employment of serviceable measures such as hydrotherapy or rational gymnastics.

It should be said that the cases which Charcot, Tourette, and Guinon had more especially in mind were of a graver nature, such as the disease of generalised convulsive tics with echolalia and coprolalia, and peculiarly resistant to treatment. Patients suffering from these forms of tic present in the most advanced degree psychical instability and volitional fickleness, and betray an irresistible tendency to impulsion and obsession, calculated to render the institution of any methodical treatment futile. In their case patience and perseverance may be rewarded, but they never

[1] CHARCOT, *Leçons du mardi*, 1888-9, p. 469.

consent to undergo for a sufficiently long period the discipline indispensable for their cure.

Fortunately, these severer varieties are exceptional. The vast majority of cases are certainly more amenable to modern therapeutic measures, and the results obtained so far place the disease in a much more favourable light. Letulle had already remarked, in 1883, that the most tenacious of co-ordinated tics might be amended, mitigated, and even wholly inhibited.

### MEDICINAL TREATMENT

All the ordinary medicinal agents in vogue in nervous and mental diseases have at one time or other been applied to the cure of tics; all have proved equally inefficacious.

Sedatives and hypnotics, such as the bromides, chloral, or the preparations of opium, sometimes effect a transient improvement, but they cannot permanently modify the psychasthenia which is the key to the situation. According to Grasset and Rauzier, the injection of morphia, atropine, curare, and the inhalation of chloroform or ether have been of some avail, as has the employment of zinc valerianate, and of gelsemium in large doses. Quinine, cannabis indica, and arsenic have also been tried.

Unexpected success has followed the administration of the bromides in some instances, and for the treatment of various neuroses, convulsive tics in particular, Flechsig's opium and bromide cure for epilepsy has been adopted by Dornbluth, with encouraging results. It is true some of the symptoms of epilepsy may be manifested in the guise of tics, while, on the other hand, the association of tic and epilepsy is not unknown; but however that may be, there is sufficient and reliable evidence to justify at least the empirical use of bromide as a last resource.

Every conceivable sedative and derivative have had their advocates, while local and counter-irritant medication has not been without support. Grasset and Rauzier obtained transitory improvement by means of strong mustard plasters; Busch applied the actual cautery to the vertebral column.

Cold, hot, and tepid douches, warm fomentations, simple, medicinal, and vapour baths, have all been prescribed. Resort has been made to rhythmic traction of the tongue, to thoracic compression, to phrenic electrisation, in all of which procedures, as Oppenheim observes, the principal effect must be a psychical one.

The predisposition of the subjects of tic to mental disturbance renders the administration of ether, morphia, or cocaine in their case inadvisable. For a similar reason it is better to avoid antipyrine, sulphonal, hypnotics generally, and above all opium in the form of laudanum or thebaic extract.

If a sedative be really indicated, we prefer the preparations of valerian, as their disagreeable odour is scarcely likely to encourage abuse of the drug. Stimulants such as kola, coca, caffeine, etc., are rather to be avoided. Hartemberg recommends the preliminary use of lecithin to improve the patient's general condition.

The inconstancy of the therapeutic results hitherto obtained must not be allowed to act as a deterrent. Success achieved by medicinal means may not always be attributable merely to suggestion.

### DIET—HYGIENE—HYDROTHERAPY

The details of the patient's diet are not to be neglected; he may be the victim of some caprice which is injuring his general health. In the case of children supervision is desirable, to obviate their eating either too much or too quickly.

General hygiene must be made the subject of special attention. We have often been convinced of the salutary effects of alteration in a patient's mode of life, or of modification of his environment, such as is ensured by holidaying, or by sea voyages, or by "cures" at watering-places and seaside resorts.

Hydrotherapy in one or other of its forms may also be utilised. Except in cases of hysteria, the tepid douche is preferable to the cold one. A morning and evening tub, followed by energetic friction of the skin, is a favourite prescription.

### MASSAGE—MECHANOTHERAPY

In every case of tic the physician ought to assure himself of the integrity of the muscles involved by examining for developmental anomalies, atrophies, hypertrophies, etc., the presence of which might lead him to reconsider his diagnosis. He may then order massage, of special value in tonic tics as a prelude to passive movements, or counsel the employment of some form of instrument or apparatus to correct muscular insufficiency or to gauge the extent and rapidity of motor reaction.

As a general rule we deprecate these devices. They are open to the same objections that have been raised to all the mechanical arrangements ever invented to counteract stammering, from the pebbles of Demosthenes to the fork of Itard, or Colombat's interdental plate, or Wutzer's glossonachon, or Morin's marbles: the patient is relieved of his infirmity only to become the slave of his instrument.

### ELECTROTHERAPY

Electricity in all forms has been requisitioned, but it does not appear to have justified its trial. In our

opinion, moreover, it is contraindicated in convulsive affections.

In cases of functional spasm of the neck, Charcot[1] was wont to extol the combined use of electricity and massage, citing instances of a very protracted and aggravated nature where relief or even cure followed the application of the induced current to the muscles not involved in the spasm.

A case in point was a man who entered the Salpêtrière in 1888 with clonic spasm of the sternomastoid and trapezius, originating in depression caused by financial losses. The symptoms were not unlike what has been described more recently as mental torticollis. The condition had resisted all treatment during nine months, but vanished with singular rapidity after a few applications of the battery, during which the unaffected sternomastoid was faradised for fifteen minutes so as to produce the inverse of the pathological attitude.

Equally satisfactory results are frequently obtained in mental torticollis from the maintenance of the antagonistic position by the hand or campimeter, or simply by order given. It ought not to be forgotten, however, that Charcot himself was astonished at these unlooked-for successes, since he closes his lesson with the sceptical injunction not to hail the victory complete nor ignore in such histories the chapter of relapses.

Several of our own patients, similarly affected, have found electrotherapy an egregious failure. Most sufferers from tic have essayed it at one time or another, and if they do not accuse it of having intensified their symptoms, the memory they retain of it is usually anything but pleasant. All that is permissible in suitable cases is to employ electricity "in psychotherapeutic doses." Let the patient see the coil, or hear the interrupter, or feel the damp electrodes, and even though the current be infinitesimal, in the sequel the suggestion

[1] CHARCOT, *Leçons du mardi*, June 26 and July 10, 1888.

may prove efficacious. Generally speaking, however, such subterfuges ought to be avoided.

### SUGGESTION

Hypnotic suggestion has sometimes given tangible results, but it is strictly applicable only to hysteria, which is, as we have seen, a comparatively rare accompaniment of tic.

Reference may be made to some cases of Raymond and Janet, where the method was successful in curing a constant giggle of four months' duration; hiccough also, and spasms of the limbs, were combated by these means.

One of the cases recorded by Welterstrand[1] was a child of ten years who had stammered ever since he could speak at all, and who in addition had for some time suffered from facial contortions—elevation of the eyelids and eyebrows, and twitching of the lips. Six séances sufficed to banish the symptoms, which at the end of several months had not recurred. Another of his patients was a young woman, twenty years old, with incessant spasmodic movements of mouth and eyebrows. The disfiguring grimaces of years disappeared completely by the tenth sitting.

Van Renterghem[2] has recorded a case of rotatory tic also cured by hypnotism. Feron[3] and Vlavianos[4] report similar successes, but one may legitimately ask whether the phenomena were not really hysterical

[1] WELTERSTRAND, *L'hypnotisme et ses applications à la médecine pratique*, Paris, 1899, pp. 74–6.

[2] VAN RENTERGHEM, "Un cas de tic rotatoire," *Journ. de neurologie*, May 20, 1898.

[3] FERON, "Un cas de tic traité par la suggestion," *Journ. de neurologie*, No. 13, 1899.

[4] VLAVIANOS, "Tic nerveux traité avec succès par la suggestion hypnotique," *Journ. de neurologie*, 1899, p. 318.

manifestations, and if the results attained any degree of permanence. Treatment by suggestion is, as a general rule, ineffectual. In Maréchal's [1] case of mental torticollis with symptoms of two years' duration, recourse was made to this measure but without avail, and our experience has been identical.

Raymond and Janet [2] have noted favourable results by the adoption of suggestion during waking hours, without going the length of hypnotic sleep; in one case of tic simulating chorea, a cure followed the threat of surgical intervention.

The same objection may be raised to ordinary as to hypnotic suggestion, that it is not of universal applicability. Besides, it is very difficult to know exactly what meaning the term is intended to convey. To encourage the patient and assure him of progress, to reproach or reprimand him on occasion, is to employ an integral and invaluable factor in all re-educational treatment of tics; but is this truly suggestion?

### SURGICAL TREATMENT

Surgical procedures are and can be applicable only to a small minority of tics, principally those of the neck, and in particular mental torticollis.

Now, while we question the necessity of emphasising afresh the uselessness of surgical interference, we believe it incumbent on us to indicate more precisely the extreme, inefficacious, and sometimes perilous nature of the measures to which patients are exposed in the vain hope of putting an end to their *mal obsédant*.

In the vast majority of cases the upshot of operative intervention is the creation of transient or permanent

[1] MARÉCHAL, "Un cas de torticolis spasmodique," *Journ. de neurologie*, May 20, 1899.

[2] RAYMOND AND JANET, *Névroses et idées fixes*, vol. ii.

muscular paralyses and pareses. Of two infirmities patients voluntarily choose the one whose evils have not yet been brought home to them. To enlighten them, to warn them against their own rashness, to impress on them repeatedly the truth of the fact that so-called radical operations do not exclude the possibility of recurrence—this we conceive to be our bounden duty.

Spasmodic torticollis more particularly has tested the surgeon's sagacity and talent. Yet in the ever-increasing number of recorded cases there is usually a curious indefiniteness of statement on a point of primary importance: was surgical aid sought for the treatment of a tic, or of a spasm?

Torticollis tic—mental torticollis—is a psychical disease pure and simple, which does not enter the province of surgery, while torticollis spasm—spasmodic wryneck—may come within the scope of the surgeon's knife, though only on condition that the irritative lesion be sharply localised. Now, not only is this information generally missing, but even more frequently perhaps a hard and fast line between the two cannot be drawn. The wisest course would be to delay the adoption of a plan of treatment whose results are so problematical, but these considerations have unfortunately been outweighed by the operator's laudable desire and expectation of ensuring respite from a most painful affliction.

It is purposely to demonstrate how invalid this plea must henceforth remain that we shall now pass rapidly in review the various surgical devices imagined for the relief of torticollis tics and spasms.

The first methods to be practised were elongation, ligature (Collier), section (Gardner and Giles), or resection, of the spinal accessory. The last of these was performed for the first time by Campbell in 1866, then by Southam, Mayor, Collier, Pearce Gould, Edmond

Oxen, Appleyard, Atkins, etc. Eliot[1] was convinced of the value of this measure, and made a special study of the technique. Coudray[2] recognised the insufficiency of section or resection of the accessory, yet decided in its favour.

> In the present state of our knowledge (he says), the treatment to be preferred for spasmodic torticollis is resection of the external branch of the accessory. Its superiority over the multiple and successive divisions of the neck muscles vaunted by Kocher—apart from the absence of proof that the latter is more efficacious than the simpler operation—is based on the view that, as the dependence of the condition on cerebral lesions and its occurrence in nervous individuals render uncertain the accomplishment of a complete cure in every instance, with such a class of patient it is essential to have recourse to an operative minimum. In nearly every case, nevertheless, marked amelioration ensues on this procedure, the benefit derived from it forming its thorough justification.

If the advantages of such an operation are not more appreciable, we must take up a position of much greater reserve regarding its suitability, particularly in view of the fact that the prosecution of a line of treatment absolutely devoid of risk may assure equally, if not more, satisfactory results.

The next step was to devote attention to the cervical nerves.

The co-existence of goitre and functional spasm of the neck suggested to Pauly[3] that pressure on the recurrent laryngeal nerve might occasion a reflex spasm viâ the muscular branch of the spinal accessory. By analogy, in some cases of spasmodic torticollis a point of irritation on one of the sensory nerves of the cervical

[1] ELIOT, "The Surgical Treatment of Torticollis, with Special Reference to the Spinal Accessory Nerve," *Annals of Surgery*, 1895, p. 493.

[2] COUDRAY, "Torticolis spasmodique, résection du spinal," *Association française de chirurgie*, October, 1898.

[3] PAULY, "Spasmes fonctionnels du cou," *Congrès français de médecine interne*, Lyon, October, 1894.

plexus might generate a reflex motor reaction in the area of the accessory, with possible diffusion to neighbouring trunks.[1] It might then be a good plan to divide the branches of the superficial cervical plexus, just as the trigeminal is divided for tic douloureux of the face.

It soon became obvious that resection of the spinal accessory was insufficient. Risien Russell[2] adduced physiological evidence to show that some of the muscular groups involved in the condition are not innervated by the spinal accessory, but by the second, third, and fourth cervical roots, section of which is imperative to obtain positive results.

The surgeon had not been behindhand, however. Gardner in 1888 was convinced of the necessity of dealing with the posterior branches of the second and third cervical pairs, a method practised a few months later by Smith and by Keen. One or two cases recorded by Ballance, according to whom division of the posterior roots was performed as far back as 1882 or 1883, are highly instructive:

A woman, thirty-two years old, had suffered for seventeen months from convulsive movements inclining the head to the right shoulder and turning the face to the left, the muscles affected being the sternomastoids, right trapezius, and complexus. On May 30, 1887, half an inch of the left spinal accessory was resected before its entry into the muscle, whereupon the spasm diminished in intensity and the sternomastoids ceased to contract. On June 6 two-thirds of an inch of the right accessory was removed, the patient being able four days later to keep her head straight by the application of her hand to the right side; but on July 4 violent spasms of the trapezius recommenced, demanding section of the posterior branch of the second pair. By the 21st there was a little stiffness of the neck on the right which speedily disappeared, and in March, 1891, recovery was still complete.

[1] PAULY, "Théorie réflexe du torticolis spasmodique," *Revue de médecine*, 1897, p. 130.

[2] RISIEN RUSSELL, *Brain*, 1897, p. 35.

The second case concerned a woman, aged twenty-nine, with convulsive movements of the trapezii dating back seven years. Resection of both spinal accessory nerves at the posterior border of the sternomastoid was practised on November 21, 1892; consecutive double trapezius paralysis revealed the fact that the deep rotators of the head on either side were similarly in a state of spasm; on December 13, 1892, the posterior branches of the first, second, and third left cervical roots were divided by Keen's method, the contractions being now confined to the deep rotators of the right side, which were to be treated in their turn in the same manner.

Comment is needless.

In a case of spasm of the left sternomastoid and certain muscles of the neck reported by Chipault,[1] bilateral removal of the superior cervical sympathetic ganglion was followed by instantaneous relief, succeeded by a relapse and a second cure; a degree of retrocollic spasm persisted.

Kocher's plan of cutting successively all the muscles affected has given varying results, according to de Quervain. This procedure has been adopted by others, notably by Nové-Josserand[2] in a case where treatment by suggestion had proved of no avail. For some days after the operation the spasm was exaggerated, although it eventually disappeared.

It is permissible, however, to doubt the definite and radical nature of these cures if we look at the long catalogue of admitted operative failures.

Linz's two cases[3] of resection were unsatisfactory. In Popoff's experience[4] tonic muscular spasm returned in spite of repeated neurectomies, in contradistinction to the notable improvement he accomplished by simple

[1] CHIPAULT, *Travaux de neurologie chirurgicale*, 1901, p. 220.

[2] NOVÉ-JOSSERAND, "Sur un cas de torticolis spasmodique," *Lyon médical*, September 4, 1898.

[3] LINZ, "Ueber spastische Torticollis," *Inaug. Dissert.*, Bonn, 1897.

[4] POPOFF, "Torticolis spastique, torticolis mental (Brissaud), torticolis psychique ou polygonal," *Moniteur russe de neurologie*, 1899, No. 4.

re-education. Tichoff[1] found the torticollis reappear four days after division of the spinal accessory, and though, in his opinion, relapse supervenes after this operation in more than fifty per cent. of cases, he expresses himself in favour of further operative interference.

Two of Dalwig's patients developed a functional torticollis to avoid the diplopia caused by a superior strabismus. Ocular tenotomy, as might have been foreseen, was quite ineffectual in checking the tic; indeed, the author himself seems to have been well aware of the necessity, in curing such vicious habits, of influencing the attention. He proceeds to emphasise the hopefulness of orthopædic, as opposed to surgical, treatment, and recommends the use of a cardboard collar, though any benefit thus derived is, in our experience, purely ephemeral.

A case of Oppenheim's underwent first tenotomy, then elongation, and finally resection of the spinal accessory, with the result that, in spite of complete atrophy of the sternomastoid and partial atrophy of the trapezius, spasm settled with renewed intensity on the splenius, omohyoid, and remaining fibres of the trapezius. Application of a seton was equally negative, but the patient soon after made astonishing improvement by a mineral water "cure"!

In face of such facts, it is truly surprising to see the increasing support given to surgical intervention. Walton,[2] for an instance, admits the central origin and progressive nature of the disease, and recognises the futility of surgical procedures, yet constitutes himself

[1] TICHOFF, "Un cas de convulsions toniques et cloniques des muscles du cou," *Soc. de neur. et de psychiat. de Kazan*, March 26 and September 24, 1895.

[2] WALTON, "Nature and Treatment of Spasmodic Torticollis," *Amer. Journ. of the Med. Sc.*, March, 1898, p. 295.

their advocate. Would it not be more in accordance with the dictates of reason and wisdom to refrain?

We must not omit to mention the extraordinary method devised by Corning[1] of injecting into the muscles a warm mixture of tallow and oil which will solidify at 37° C., to which proceeding he proposes to give the fantastic name of *elœomyenchisis*. The idea is to fix previously relaxed muscles. He does not seem to have had many imitators.

Torticollis apart, few tics invite treatment at the hands of the surgeon, with the exception of facial tics or spasms.

Here, too, the results have usually been anything but encouraging. Stewens[2] reports three cases of facial tic cured by the correction of errors of refraction, while elongation of the facial nerve failed of its object. Resection of a branch of the trigeminal is valueless; facial elongation only causes a corresponding paralysis, and should this latter accident be transient, as in a case of Bernhardt's, so is the relief from the tic.

To obviate the much more frequent inconvenience of a permanent facial paralysis, J. L. Faure[3] suggests spino-facial anastomosis. In a woman suffering from contracture and spasmodic twitchings in the region of the facial, Kennedy, of Glasgow, divided the nerve and immediately anastomosed the cut end laterally with the spinal accessory. At the end of fifteen months the spasm had vanished and the paralysed facial nerve had recovered its functions.[4]

[1] CORNING, "Elœomyenchisis, or the Treatment of Chronic Local Spasm by the Injection and Congelation of Oils in the Affected Muscles," *New York Medical Journal*, 1894, p. 449.

[2] STEWENS, "Facial Spasm and its Relation to Errors of Refraction," *Amer. Journ. of the Med. Sc.*, 1900, p. 33.

[3] FAURE, "Traitement de la paralysie faciale d'origine traumatique par l'anastomose spino-faciale," *Presse médicale*, 1901, p. 259.

[4] *See* BREAVOINE, *Thèse de Paris*, 1901.

Strictly speaking, then, in certain cases of genuine facial spasm the possibility of some such treatment may be entertained if all other means have failed, but persistence of the facial palsy and the grave consequences it may entail are always to be dreaded. In facial tics, however, under no pretext whatever is the surgeon justified in attempting to interfere.

In the case of spasms properly so called, efforts directed to the removal of the exciting cause—should it be known—are often crowned with success. Conjunctivitis, rhinitis, odontalgia, may occasion grimaces and contortions which cease with the disappearance of the irritation. In 1884 Fraenkel showed to the Medical Society of Berlin a woman, forty-five years old, with mimic convulsions of four years' duration, attributable to a rhinitis. Every time the mucous membrane of the left nasal fossa was touched a violent spasm ensued; but a few applications of the galvano-cautery brought the phenomena to an end.

Oppenheim has seen facial and masseter spasm checked by the extraction of a carious tooth, and in another case by an operation on the ear.

Emphasis must once more be laid on the fact that any success achieved has been in reference to spasms; as much cannot be said of tics and analogous affections. The surgical treatment of stammering has long since received its quietus.

We may bring this discussion to a close by applying to tics in general certain considerations of Brissaud[1] anent mental torticollis:

"Instead of proceeding to operate at once and being content thereafter to enjoin on the patient, whenever the wound is healed, a course of exercises to be persevered with over long months or even years, better

[1] BRISSAUD, *Revue neurologique*, 1897, p. 34.

give the same good advice long months or even years before inflicting him with the operation."

### ORTHOPÆDIC TREATMENT

The use which has in some instances been made of various forms of apparatus for temporary fixation or for gymnastic purposes is, as a rule, rather hurtful than otherwise. The patient is disconcerted by their withdrawal, and prone to recommence his inopportune movements. It is preferable to allow him to adopt his own attitudes independently of the physician. An accessory not always at hand must not be allowed to become indispensable to the control of his tic, else he may make its absence a pretext for the discontinuation of his exercises.

Excellent results, it is true, have been obtained in chorea by recourse to apparatus of restraint. According to the recent descriptions of Huyghe [1] and of Verlaine,[2] after the administration of a few whiffs of chloroform to the patient, the affected limbs are massaged vigorously enough to enable him to have some conception of what is being done. Light anæsthesia is continued while they are immobilised in duly padded splints and covered closely with bandages. At the end of five or six days the dressings are removed, when all choreic twitching will be found, as a general rule, to be gone; should it persist, the treatment must be repeated. In numerous instances the method has been eminently successful.

So favourable an issue is scarcely to be looked for in the case of tics. Rather are these forms of apparatus liable to do harm in the direction of fresh outbursts.

[1] HUYGHE, "Du traitement de la chorée hystérique par l'immobilisation," *Le nord médical*, August 1, 1901.

[2] VERLAINE, "Traitement de la chorée arythmique hystérique par l'immobilisation sous chloroforme," *Thèse de Lille*, 1901.

## CHAPTER XIX

### TREATMENT BY RE-EDUCATION

THE author of the article "Tic" in the Dictionary in Sixty Volumes of 1822 urges the necessity of care and perseverance in the correction of the involuntary movements characteristic of the disease. In 1830 Jolly recommended different exercises in the treatment of convulsions, as a means of interrupting the sequence of certain spasmodic phenomena. Blache's[1] adoption, in 1851, of medical gymnastics in cases of "abnormal chorea" was attended with excellent results; and Trousseau, as we have seen, extolled the value of exercises systematically applied to the muscles involved in non-dolorous tic. The principle of the treatment consisted in the regular execution of given movements by the muscular groups affected, to the rhythmical accompaniment of a metronome or the pendulum of a clock.

In these instances we have a forecast of the modern methods of re-education, so successfully employed to combat tic.

Letulle advises an appeal to the intelligence, good sense, and will of the patient in the endeavour to provoke an inverse effort at the moment when the tic begins, or even before. It is the prerogative of the physician to indicate suitable exercises and to encourage and aid

[1] BLACHE, "Traitement de la chorée infantile," *Gazette hebdomadaire*, 1864, p. 787.

the patient in his attempts. Even the most inveterate of tics may thus be controlled and made to disappear. On the other hand, the *Traité de médecine* ignores the subject, while Lannois' paper in the *Traité de thérapeutique* contains the statement that in the treatment of myoclonus—under which term various indefinite convulsive movements are comprehended—no method has hitherto been of any avail. Yet in another section of the same book we discover some sound advice anent tics and choreas of hysterical origin, emanating from the pen of Pierre Janet.

> It is well to study the influence of the attention on these conditions; some tics are contingent on the direction of the patient's attention to them, others appear solely during times of distraction. . . . Education of movements by some form of drill may be of the greatest utility.

These general therapeutic indications are applicable to all kinds of tic, independently of their form and localisation. Moreover, they conform to the procedures advocated by Brissaud since 1893.

So long as tic is regarded as a purely external phenomenon, treatment is bound to be insufficient; but recognition of the relations between the convulsion and the mental state of the subject has made possible a rational therapeusis. There can be no doubt, thanks to the laborious work of Bourneville, that systematised mental discipline has sometimes a surprising effect on congenital psychical imperfections; and where the patients have attained a higher level of mental development, re-education has shown itself to be the method *par excellence.*

The credit of initiating treatment by forced immobility is due to Brissaud, who in the year 1893 first utilised the method in cases of mental torticollis. In the face of the risks of surgical intervention and the unsatisfactory nature of existing therapeutic measures, Brissaud emphasised the value of motor

discipline in tic,[1] and it was not long ere rules were formulated and precision introduced into the application of the method.[2] The results were certainly encouraging, so much so that improvement could be promised if treatment was sufficiently protracted; cure, indeed, followed in various instances.

Brissaud's method is a combination of immobilisation of movements with movements of immobilisation. Speaking generally, the patient is directed to perform certain appropriate exercises under given conditions. Some of these exercises are intended to teach him how to preserve immobility, while the object of others is to replace an incorrect movement by a normal one. In the case of the former, immobility is alike the goal in view and the means of attaining it, while by recourse to suitable movements, in the latter instance, the same end is sought.

It is essential to remember that the exercises must be graduated. To begin with, the subject of tic is required to remain absolutely motionless, as for a photograph, for one, two, three seconds—in fact, as long as he can without fatigue. Very gradually the period is increased, for patients have their good and their bad days, and too great a demand on one day is apt to be succeeded by a relapse on the next. One must

[1] BRISSAUD, "Tics et spasmes cloniques de la face," *Journ. de médecine et de chirurgie pratiques*, January 25, 1894. BRISSAUD AND MEIGE, "Trois nouveaux cas de torticolis mental," *Rev. neur.*, December 10, 1894, p. 697. BOMPAIRE, "Du torticolis mental," *Thèse de Paris*, 1894. FEINDEL, "Le traitement médical du torticolis mental," *Nouv. icon. de la Salpêtrière*, 1894, p. 404. *Id.*, "Le torticolis mental et son traitement," *Gazette hebdomadaire*, February 20, 1898, p. 169. FEINDEL AND MEIGE, "Revision iconographique du torticolis mental; cas anciens et cas nouveaux; traitement," *Congrès de Paris*, 1900, *volume de la section de neurologie*, p. 513. *Id.*, "Quatre cas de torticolis mental," *Arch. gén. de médecine*, January, 1901, p. 61.

[2] BRISSAUD AND FEINDEL, "Sur le traitement du torticolis mental et des tics similaires," *Journal de neurologie*, April 15, 1899.

rest content with even the most insignificant gain at first, and soon the seconds will grow into minutes, and the minutes into hours. It is desirable to specify on each occasion the duration of the expected immobility. Place the patient at the outset in the position in which his tic manifests itself least often, and do not cease to encourage him by affirming that he can and must remain immobile. Once the séance of immobilisation can be maintained for as much as five or six minutes, begin to modify the patient's attitudes. If he has been comfortably seated during the opening performances, try him when he is standing, and as soon as he has accomplished this, vary the position of his head, arms, trunk, and legs, repeating the séance in each case. Eventually he will learn to maintain immobility of certain parts of his body while he is walking, or while he is executing given movements with his arms or legs. In all these performances direction must be specially directed to the patient's tic. The method is obviously simple, so much so that he may be inclined to question its utility and may fail to grasp its import. One must not hesitate, however, to explain its purpose; indeed, the rapid and intelligent appreciation of the method on the part of the patient is a *sine qua non* for success. Patient and doctor must co-operate in defence and attack; and their union will culminate in triumph.

Simultaneously with this discipline of immobilisation the subject must be taught the discipline of movements. The idea is to make him perform slow, regular, and accurate movements to order, addressing oneself to the muscles of the area in which the tic is localised. They must be very simple at first, and the exercises must be very short. The séance should never be prolonged beyond a few minutes, making, with the immobilisation, not more than half an hour. This time will, of course, soon be increased, but it is of prime importance to

avoid fatigue. The performances should be gone through three, four, or five times a day, and always at the same hours. One of them at least ought to be under the personal direction of the physician, whose duty it is to modify, instruct, exhort, reprimand, as the case may be. In his absence the supervision of the exercises must be left to some responsible individual, who has an eye for faults as well as for progress. Statements by the patients themselves are to be considered with reserve.

The repetition of the prescribed exercises should take place in front of a looking-glass, whereby the patient may be exactly informed of any mistakes in gesture or attitude. He cannot otherwise judge of the degree of immobility attained, and may deceive himself, although he has the best intentions in the world, as to the real state of affairs. He does not know whether he is holding himself straight or not, as a general rule, but a glance in the mirror will correct his fault. A careful register must be kept of the progress he makes. Little by little the jurisdiction of the physician will be reduced, provided the patient maintains his interest in his own treatment. Indifference and discouragement are fatal, and it must be the physician's aim to prevent their occurrence.

Séglas has reported the history of a woman with mental torticollis, who submitted to treatment by Brissaud's method, and a remarkably quick alleviation was the result. At the end of three weeks, however, she allowed her interest to slacken, and ere long the benefits obtained were entirely frustrated.

It cannot be too often repeated that even though the tic disappear, the patient must not be abandoned to himself, but must be persuaded to continue his exercises. This is the price of success. As time goes on, it is true, he encounters fewer difficulties in his

way, and once he is conversant with the method, he may be able to work out his own salvation.

In the case of children, the efforts of the medical man may often be seconded by parent or teacher, who has assisted at the first lessons and is in a position to superintend their repetition. On the other hand, treatment may be nullified by deplorable weakness on the part of father or mother. One of the reasons for the existence or at least the persistence of tics in children is that there has been no attempt at their correction when they were still "bad habits." Neglect or indulgence is an etiological factor of the first importance, as we have already seen. Many a time we have had occasion to note this, notwithstanding the protestations of the family. Fear of aggravating the mischief is sometimes advanced as a reason for non-interference. Nothing could be more misleading.

The method which seeks to check the youthful *tiqueur* by the multiplication of threats and penalties is not to be countenanced; it produces the opposite effect to what is intended. Clearly the educational therapeutic measures we have been advocating demand a patience and an ingenuity on the part of both doctor and patient which we have no desire to minimise, but it is along these lines that success is to be reached.

A noteworthy adjunct to treatment is to sketch out a daily routine for the patient to follow regularly and punctually. His mental disarray is patent not merely from his disorders of motility, but in the unmethodical and changeable habits of his everyday life. To introduce discipline into his manner of living is a most wholesome step. To find something with which to employ his leisure time, to direct his energies into suitable channels, will prove to be eminently beneficial, not merely for the child but also for the adult. Those who tic ought to be able to contract good habits as

readily as bad, provided their instructor be sufficiently persevering and inventive.

There is an infinity of occupations for the patient to put his hands to, and this variety suits his unsettled mood and his wavering attention; but longer efforts will be secured from him if his interest in his task can be engaged and stimulated as well. It is a good plan to make him write down each day what he does and how it is done, and to have him rehearse from time to time. Such pedagogical details are far from being superfluous; adults, moreover, are quick to gather their significance and to demonstrate their advantages in practice. That their fickle will must be reinforced they know well; how to achieve this end they are unaware. This fact explains their eager acceptance of the support furnished by these "moral crutches."

Generally speaking, there is no call to interrupt treatment once it is commenced, although occasionally we have found this desirable. The fatigue of the first few days, almost unavoidable as it is, and accompanied by new sensations, need occasion no alarm. We should acquaint our patient of its explanation, and so obviate the mental depression which its existence is apt to engender. Its ephemeral nature will soon become plain, for a rest of a few days suffices for its disappearance.

In some instances resort to procedures reminiscent of antagonistic gestures seems to have been of avail.

One of our patients,[1] suffering from facial tic, was directed to perform, as far as practicable, the opposite movements to her grimaces. If her mouth was drawn to the right, she forthwith made a corresponding twitch to the left; if her mouth was shut spasmodically, she was instructed to open it widely and quickly. By such simple methods, applied to all her tics, speedy control

[1] FEINDEL, "Spasmes grimaçants de la face, datant de trois mois," *Revue de psychologie clinique et thérapeutique*, April, 1899.

was regained, and once she had mastered the theory of the process, the practice of regular exercises and the development of antagonistic movements soon effected a complete cure.

Training of the antagonists has also been recommended by Hartenberg,[1] in a case of scratching tic. The patient was urged to approximate the hand to the affected cheek very slowly, and almost at the moment of contact the order was given to extend the arm briskly; this gesture of opposition, moreover, was stimulated by faradisation to the extensors of the forearm. The method, of course, is practically identical with that adopted by Frenkel,[2] of Heiden, who provoked energetic contractions of antagonistic groups by teaching the patients to overcome increasing resistances. Prudence, however, must be observed in carrying out these ideas, otherwise we run the risk of replacing one tic by another.

After the above general sketch of the essentials of the method, we may give examples of its application to particular instances.

For a tic of the eyelids, in especial for blinking tics, we make the patient open and shut the eyes to order, keep them closed or apart for a space, shut one eye and then the other, and repeat the same sequence in different positions of the head. It is a good plan to enjoin simultaneous action of the oral musculature. The cessation of tonic contractions of the eyelids with opening of the mouth has been remarked several times, and Oppenheim finds an analogy in the observations

[1] HARTENBERG, "Traitement et guérison d'un cas de tic sans angoisse," *Revue de psychologie clinique et thérapeutique*, January, 1899, p. 17.

[2] FRENKEL, "De l'exercice cérébral appliqué au traitement de certains troubles moteurs," *Semaine médicale*, 1896, p. 124.

of Gunn and Helfreich, who have seen ptosis disappear as the mouth is opened.

If the eyeballs are involved in a tic, insist on dissociating the movements of head and eyes; make the patient follow an object slowly with his eyes while the head is stationary; or let the head deviate to right or left, up or down, while the eyes remain fixed on some particular point.

When the lips are the seat of involuntary muscular action, have the patient show his teeth, open and shut his mouth, purse his lips; make him speak and conform his expression to his speech; let him read aloud slowly, and fix his attention on his subject.

As a specimen of treatment for a facial tic, we may cite the subjoined programme:

> Every day, and three times a day, at the same hours—nine, one, and six—the patient is to look at himself for two minutes in a mirror, preserving absolute immobility the while; to read aloud for two minutes, to speak in front of the glass for two minutes, to walk backwards and forwards in front of the mirror for two minutes. During the ten minutes of these exercises he will endeavour to keep his facial musculature under control. If the tic assert itself in the course of one of the exercises, he will recommence the latter, if necessary twice; the third time he will leave it till the next séance.

For tics of the head and neck, such as tossing tics and mental torticollis, inclination and rotation movements are indicated, of which an instance may be quoted:

> Mademoiselle R. is quick in learning how to correct her muscular faults. Her actions are gradually becoming more complete and ample, and if she performs her allotted task with little animation, at the least there is no question of her indefatigable willingness. In less than a month she has been able to fix her regard, open her eyes widely, turn her head, uninterrupted either by halts or twitches; she can remain motionless in front of a looking-glass for as long as a minute. Equally

satisfactory progress has been made in the art of reading aloud; she breathes more regularly, and articulates more distinctly.

Thus the patient has come to realise that she need but give her attention to the involuntary movements for them to cease, and there has been a synchronous advance in her mental activity and power of concentration. Her nonchalance and timidity have diminished; she is no longer indifferent to her surroundings, nor furtive in her glances; she enters into conversation with zest, and her movements are characterised by decision.

Take another example of treatment, for a case of mental torticollis:

Stand or sit in front of a mirror and endeavour to maintain an absolutely correct position of trunk and shoulders.

Lift the arms vertically and turn the head to the right, then lower the arms while the head remains as it is.

Bend the body forward, and stretch the arms out till they touch the ground, the head meantime being rotated to the right. Then rise up again with the head in the same attitude. After two or three efforts it will be found that the head can be kept straight for a few seconds.

In tics of the limbs, shoulders, hands, feet, innumerable movements will suggest themselves for practice. The young girl with a tic of genuflexion, under the care of Oddo, supplies an excellent proof of the value of Brissaud's method:

The immobilisation of movements was realised by the mother forcing the child to remain motionless in a fixed position for augmented periods. As for movements of immobilisation, the patient made peregrinations of increasing length under the mother's eye, the order being repeatedly given to suppress the genuflexions. At the same time, massage and passive movements to the limbs and joints were prescribed, with a view to diminishing the articular cracks—the exciting cause of the bizarre tic from which the girl suffered.

In the course of ten or twelve days the genuflexions had entirely vanished, and a return of the pain in the coxo-femoral articulation aided materially in consolidating the effects of the treatment.

Tics of speech should be handled in the same way as stammering. "We do not treat stammerers, we

educate them," says Moutard-Martin. There can be no gainsaying the convincing results obtained by Chervin's technique.

For years there has been unanimity of opinion on the value of respiratory gymnastics in the treatment of stammering. The plan is to make the patient inspire deeply and quickly, and follow this with a prolonged expiration. Difficulties of articulation and phonation may be overcome by recitation, by declaiming, by scanning utterance, by dwelling on the vowels, etc. Various authors have laid stress on the advisability of concomitant therapeutic treatment.

In cases of stammering (says Olivier), all surgical interference is to be deprecated. Operations on the nose or throat are directed toward the removal of obstructions in the air-ways, but they are merely a preparatory step to the adoption of the education method. No one of the vaunted "cures" for stammering is infallible, since all depend in the last resort on the will power of the patient, nor is there anything mysterious about them. Isolation is not always indicated; what is indispensable is reinforcement of the will.

The intimate relation between tics of speech and various kinds of stammering has led to the application to both of the same re-education methods. Pitres,[1] in particular, bases his line of treatment for tics in general on regulation of respiratory activity, as he has observed that tics diminish or die away with a deep and regular respiratory rhythm. His plan is as follows:

Supported against a wall, with shoulders braced back, the patient is instructed to take slow and deep inspirations, raising his arms the while, and letting them fall with expiration. This performance is repeated three times a day, for ten minutes at a time.

[1] PITRES, "Tics convulsifs généralisés traités et guéris par la gymnastique respiratoire," *Journ. de médecine de Bordeaux*, February 17, 1901, p. 106.

The method has been elaborated by Tissié, and Cruchet also has thereby obtained excellent results, which he has put on record in his thesis.

The patient is placed upright against some support, his heels together and his arms by his side. For the first three minutes he recites aloud, drawing a slow deep breath at frequent and regular intervals. Then he proceeds to make similar long inspirations and expirations, elevating his arms synchronously with the former, and depressing them with the latter. The exercises may advantageously be repeated every three hours to begin with, then their duration may be increased and the intervals lengthened, until the séances are extended to fifteen minutes three times a day. Their continuance will vary with the individual, but the ultimate aim is to reduce the period and to spin out the interval still more, until eventually their object has been attained and they may cease.

A concrete example may be given:

A young man had suffered for eleven years from generalised tics of peculiar intensity. Every few seconds violent twitches of an electric-like rapidity seized the muscles of his head, trunk, and limbs, to the accompaniment of abrupt cries and inarticulate growls. A sojourn of a few weeks in hospital, and the acquisition of the most elementary technique in athmotherapy, resulted in a complete cure ere many months had passed.

Tissié explains the action of this method on tics by a special action of regular respiration on psychomotor centres. Raymond and Janet incline to the opinion that attention depends on respiratory activity, but Tissié[1] argues there is antagonism between deep respiration and maintenance of attention, and Cruchet supports this hypothesis.

If we prescribe respiratory exercises, we are temporarily suppressing the attention, and reducing psychical activity to a minimum. Thus tic, which is a reflex of thought, does not occur, and if the exercises are renewed often enough, the habit will gradually be lost.

[1] Tissié, "Tic oculaire et facial accompagné de toux spasmodique, traité et guéri par la gymnastique médicale respiratoire," *Journ. de médecine de Bordeaux*, July 9 and 16, 1899.

In our opinion, it is precisely the bestowal of the attention on the allotted task that has such a salutary effect. Whatever be the movements, they demand of the patient a momentary halt, a momentary interruption of those ill-timed motor reactions that make concerted action impossible. Observation shows that the degree of successful control is in proportion to the degree of concentration of the attention. The novelty of the exercise in itself acts as a stimulus, but when this novelty wears off, faults are prone to reappear. Hence the necessity of varying the procedures, and of rendering them always interesting; in the end the habit of supervision is contracted, and the patient feels increasing satisfaction in watching his physical infirmities daily diminish and the resources of his will daily widen.

Respiratory drill is an admirable method of procuring this result; it acts in the same way as any of the other exercises. Its use is not confined to tics of speech or of respiration, for thoracic muscles are involved in tic much more frequently than is commonly supposed. By resort to this technique Madet cured an expiratory hiccough[1] in a man of forty-six, who was afflicted in addition with twitches of head, trunk, and hands.

Systematised exercises have of course the advantages of exercise in general; motor, sensory, and psychical functions alike are stimulated and regulated, and tend to become normal. In particular, muscular exercise is a striking way of disciplining volition. Accordingly, we never fail to prescribe such pastimes as gymnastics, in any of its forms, rowing, fencing, cycling, lawn tennis, etc.; games which demand attention, skill, and decision are useful auxiliaries, and manual occupations of a more delicate nature ought not to be forgotten, provided

[1] MADET, "Myoklonie in der Art eines expiratorischen Singultus," *Weiner medic. Blätter*, No. 30, 1899.

they require of the patient a certain amount of immobility. Every case, needless to say, must be treated on its merits, but the general indications we have supplied can easily be modified to suit the individual.

The various procedures directed, under different names, to the suppression of tic by re-education, are all modelled on the same plan. Köster attributes the disease to exhaustion of higher co-ordinating centres, and counsels their reinforcement by appropriate exercise. Oppenheim, in his *Lehrbuch der Nervenkrankheiten*, adduces evidence of the value of what he calls *Hemmungstherapie*, which is merely an application of the principles and therapeutic rules laid down by Brissaud in 1893, and described by one of us in 1897, apropos of mental torticollis. The same may be said of the line of treatment pursued by Dubois, which appears to be based on the pathogenic interpretation given by Oettinger,[1] according to whom the brain of tic patients is incapable of conserving the image of sustained immobility, and thereby loses the habit of voluntary immobilisation. The essence of treatment, therefore, consists in habituating the subject to rest motionless like a statute in a position conducive to repose, and for a given time.

As has been already remarked, the polymorphism of tics is such that the plan of treatment selected must be necessarily elastic if it is to be altered to suit individual cases. What is the point in enjoining absolute immobility on a patient whose blepharotic is never in evidence unless he is walking about?

We may now proceed to narrate the details of various cases of tic treated by the combined method of disciplinary movements and immobility, taking the history of O. as our first example.

[1] OETTINGER, "The Disease of Convulsive Tic," *Amer. Journ. of the Med. Sc.*, September, 1899, p. 303.

*October* 15, 1901.—Séance of absolute immobility in the upright position, with the head straight, for five seconds ; to be repeated in front of a mirror for five minutes, with intervals for rest of fifteen seconds. Movements of rotation of the head to left and right, with progressively lengthening pauses in each of the extreme positions. Respiratory exercises with elevation and depression of the arms eight times a minute, decreasing steadily to four a minute. These exercises are to occupy a quarter of an hour morning and evening. Explain to the patient the action of the sternomastoids and how they combine to fix the head. Make the patient lie on his back and move his head antero-posteriorly.

*October* 19.—O. has still his tics, but he can already remain motionless on command, and is conscious of satisfaction in so doing. Just as his exercises come to an end there is always a momentary recrudescence of the tics, but a very appreciable calm follows.

*October* 21.—Immobility is maintained well for half a minute. The patient is to resume his cycling and fencing, physical exercises which he has abandoned for more than a year.

*October* 25.—O. considers himself greatly improved. He has gained insight into the way of combating his tics, and his self-confidence is on the up grade. For several days he has devoted his attention to his tic of blinking, with the result that he can open his eyes longer and more easily.

*October* 28.—He evinces a preference for certain of the exercises : if they please him, he performs them accurately ; if they do not, they are neglected.

*November* 20.—The head tics are still rather violent at times. A period of intellectual and bodily fatigue has supervened, but he tries his fencing again, and to his profound satisfaction he has managed to keep free of tics during the bouts. He is recommended to avoid all possible causes of cerebral and physical exhaustion.

*December* 3.—He continues to make satisfactory progress. His habit of supporting his chin on his cane is abandoned, though an attempt to dispense with the latter entirely, when he is out in the street, has ended disastrously. He is content to hold it in his hand and strike his leg with it from time to time.

*December* 13.—Whenever O. is tempted to tic again, he stands in front of a mirror and commences to sing, and while the song lasts his tics remain in abeyance. His trick of sitting crossways on a chair and rubbing his chin against the back is also discarded, with the result that the callosities have vanished. As far as his walking is concerned, he has adopted the plan of endeavouring to get from one point to another without allowing his tics to assert themselves, and his efforts have been crowned with success.

*February* 3.—The patient has recovered his self-confidence, and the

compliments of his friends prove an additional restorative. It is true the tics still recur, but their number is less, their duration shorter, their severity considerably diminished. What O. is best able to appreciate is the disappearance of the state of *mal obsédant* that accompanied them.

Take another example in the person of young J.:

In his case our object was to discipline him by successive modifications of his caprices. The first important result achieved was the suppression of his precious mattress—a result not obtained without difficulty, for the mere mention of it sufficed to provoke floods of tears and ebullitions of anger. He was then sent into the country for a few days to forget his heart's desire, but the labour was lost. No sooner had he arrived than he discovered another mattress in a barn, and transferred his affections to it.

Eventually the day came when he was finally convinced of the absurdity and inconvenience of his practice, and when the tender yet firm remonstrances of his parents prevailed. The prospect of congratulations awaiting him, and his own keenness to get better, stimulated him to fresh efforts, and the reward was success.

Not long after, however, he began to complain of mental suffering from the restraint laid on him, and the distress was undoubtedly genuine. We accordingly gave him permission to stretch himself on his bed at certain fixed times and for a fixed period, which was to be reduced each day by some minutes. He entered into the spirit of the regulations so happily that in less than a month the period spent in the horizontal position had sunk from two hours and three quarters to an hour and a half daily, and at last it was dispensed with altogether.

On his "nervous movements" re-education by immobility and methodical exercises had a beneficial influence, and he acquired the faculty of controlling his variable and attitude tics. Repetition of the séances under the eye of the physician, drill in front of a looking-glass, symmetrical and synchronous exercises for the arms, as well as ordinary practice in dressing and undressing, buttoning and unbuttoning clothes, eating, drinking, etc., with the left hand—all contributed materially to his progress. Many other re-educative prescriptions were enjoined on the patient; suffice it to say that in three months he was able to dress and feed himself, to behave properly at table, and to restrain himself generally, in spite of the obstacles provided by his babyish tricks and natural weakness.

Further, the advance he has made has reacted profitably on his mental condition, and if his fickleness and vacillation persist, at the least the trend of the educative exercises has been in the direction of reinforcement of the will. Hence is it that he is now more attentive, less introspective, less capricious; he is no longer overwhelmed at the gravity

of his condition ; he is conscious of having taken its measure, and of his power to master it.

We have also applied Brissaud's method to the treatment of variable chorea, with no less encouraging results. Its worth in cases of mental torticollis has been noted by several authors as well as by ourselves. A cure resulted in a peculiarly difficult instance recorded by Martin [1]:

A young man of twenty-six suffered from melancholia and hypochondriasis. He used to complain that his limbs were hopelessly rotten, that his hands, feet, legs, were gone, vanished ; his head and neck had ceased to exist. So easily was he irritated that to most questions he vouchsafed no answer. His sentiments of affection were much blunted ; a visit from his mother evoked no pleasurable sensation. All day long he used to lounge on a couch, his head sunk on his breast, and inclined somewhat to the right. The attitude was exaggerated if he was addressed, but while he could raise his head, by the help of his hand, to regard his interlocutor, it resumed its position of flexion as soon as he withdrew the support. Confined to the left side of his face was a tic which consisted in abrupt and jerky elevation of the corner of the mouth. On request, he would gain his feet laboriously and walk with abdomen protuberant, back arched, and legs apart. From time to time the neck musculature on the left side was the seat of convulsive movements. The left sternomastoid and trapezius were in a state of tonic contraction, and on any attempt being made to correct this vicious attitude, spasm occurred, and the patient resisted to his utmost.

On March 10, 1900, treatment was begun ; an effort was made to gain the patient's confidence by explaining that a cure was within the bounds of possibility, and by demonstrating to him that his limbs, which were in a state of slight contracture, could be moved by his hand. The procedure was renewed three times a day, and followed by baths and massage.

By April 15 the contractures had disappeared, and he could perform any movement of relaxation himself. His attention was now drawn more particularly to his head, which was still in a faulty position, and annoyed him considerably. Advantage was taken of an improvement in his tractability to make him perform some movements of his neck. At first the mere effort produced a spasmodic contraction, but he was able to move his head very slightly up and down. After five months of such treatment, occupying on an average three hours a

[1] MARTIN, *Congrès de Limoges*, 1901

day, his mental torticollis was finally reduced to subjection, an interesting feature of the case being the parallelism between the physical and the psychical improvement.

On three occasions since we have noted a recurrence of the torticollis, but each time it has been both brief and easily overcome. The cure has been maintained now for upwards of a year, and four months ago the patient resumed his work.

We must impress ourselves with the importance of recognising the proneness of tics to relapse. Any triviality which may have a prejudicial effect on the patient's will-power is calculated to facilitate the re-awakening of a bad habit. Such relapses are commonly transient, and are instructive in so far as their manifestation sometimes differs from the original tic and entails alterations in treatment.

L., for instance, whose condition was one of permanent rotation of the head to the right, had a fit of depression after eight days of treatment and noteworthy improvement, a depression so severe that she questioned the practicability of a cure, and forthwith her head began to turn to the right again. On this occasion, however, the tic was an intermittent one, consisting of clonic contractions of the cervical muscles chiefly, without antagonistic gesture. For five days the fit persisted, and was sufficiently acute to render omission of the exercises advisable.

After some days' rest a beginning was made with the treatment again, under the direction of one of us and in the presence of her father. We took care to place ourselves always in front and to the left of the patient, on the side opposed to her torticollis. The position allotted her at table was such that in order to converse with her parents she had to turn to the left.

Not long thereafter a second fit of depression occurred, but on this occasion her head began to rotate to the left. She had been under treatment for six weeks, when she made the remark one day that her head seemed once more to be drawn to the right. She hastened to add, moreover, that she had discovered a means of remedying the mischief—viz. by putting her left hand to her left cheek—a corrective proceeding nothing short of paradoxical.

It was about this time that the pains and dragging sensations in the muscles of the neck subsided. On the other hand, for days on end, then for gradually diminishing periods, there existed a slight

trembling of the head, due to muscular exertion, and explicable by the contraction of small cervical muscles on one side and their antagonists on the other.

On more than one occasion we have remarked this trembling as the forerunner of a cure. It vanishes spontaneously as the amelioration of the patient's condition becomes more definite.

Several months may intervene between relapses. Descroizilles cites a case of convulsive movements of the head and shoulder of three years' duration, which yielded to exercises in a few weeks. The tic reappeared six months later, and, resisting treatment by gymnastic discipline, was cured by suspension. Three months later it returned once more.

Facts of this description emphasise the desirability of considering rapid cures with reserve; where the improvement, on the contrary, is insensible, the results are much more likely to be permanent. Unforeseen complications, a again, may arise once a cure is affected.

One of our patients[1] had been rather quickly relieved of a mental torticollis by the usual therapeutic measures, and we had allowed him to resume his avocation, when he suddenly appeared in a depressed and despairing mood a month later to say that he was worse than ever. The rotatory tic had not returned, it is true, but its place was taken by another phenomenon. If, as he walked along with head straight, his attention was suddenly directed to the right, he seemed at once to become "crystallised"; he halted, and could not deviate his head as he wanted, and at the same moment something appeared to choke him; in three or four seconds all was over, and his action unimpeded. As a result of these attacks he sank into a wretched state of more or less permanent anguish. A visit to his country home was of little avail; no sooner had he arrived than his head began to twist about in every direction, although, try as he would, he could not move it backwards. We accordingly prescribed absolute rest in bed, a strict regime,

[1] BRISSAUD AND FEINDEL, "Sur le traitement du torticolis mental et des tics similaires," *Journ. de neurologie*, April 15, 1899.

hydrotherapy, and unfailing regularity in the performance of gymnastic exercises. Not long after a fresh torticollis developed, by which the chin was deviated to the left and the head tilted to the right. Once more we initiated a scheme of regular drill, and in the course of a short time a satisfactory cure ensued. During the last three years we have had frequent opportunities of seeing our patient, and can certify that he remains mentally and physically normal.

Facts such as these teach us two things: the task of the physician is not ended with the disappearance of the tic, for it is the pathological mental state of the patient which renders him so easy a prey, and if we can modify that state by re-education, we may count on the cure being permanent. For a long time, however, we shall be well advised to talk simply of improvement. In the second place, relapse or slowness of progress is no reason for despair; treatment may have to be persevered with for a year or years, till the patient learns how his muscles act, how to maintain immobility, and how to effect a voluntary movement—notions which his fickle mind has hitherto neglected to grasp. Education of the will in the direction of control is calculated to bring him into line with normal individuals.

A radical cure is not without the bounds of possibility, but it depends greatly on the patient himself; his success is contingent on his faithful repetition of exercises long after the tic is gone; for while a cure results whenever the tic ceases to incommode its subject, fatigue or emotion on some future occasion may reawaken the tendency to involuntary movements, and only a methodically trained will can triumph over the temptation to relapse.

With this reservation, one may expect permanence in the cure, provided the affection is of recent date and the patient gives evidence of his assiduity and desire for relief.

### MIRROR DRILL

Among various re-educational procedures which are worth mentioning for their practical value, a place must be given to what has been called mirror drill by one of us.

We all know that the term mirror writing is in use to specify that mode of caligraphy which looks exactly like ordinary writing when it is reflected in a mirror or if the paper is held to the light and seen from the reverse side. Mirror handwriting may be done with either hand. If the right hand be employed, the characters are traced from right to left and are centripetal in relation to the axis of the body. If, on the contrary, it is the left hand that we use, the letters go from right to left, but they are centrifugal.

Innumerable examples of this condition have been described and various theories elaborated. Apart from such cases, it is a matter of common observation that if any one be asked to write synchronously with the two hands, his left hand will tend spontaneously to adopt the mirror form.[1] The experiment may be tried on some one who has never made the attempt to write with the left hand, and has never heard of mirror writing. Ask him to abandon his left hand completely to the movements it may be constrained to fashion while the right hand is tracing the required words, and let his eyes be closed; in practically every case the left will make mirror characters. It may therefore be contended that mirror writing is the natural writing of the left hand, an opinion supported by Vogt, Durand, etc., and more recently by Ballet,[2] who remarks that

[1] MEIGE, *Congrès du Limoges*, 1901.

[2] BALLET, "L'écriture de Léonard de Vinci: contribution à l'étude de l'écriture en miroir," *Nouv. icon. de la Salpêtrière*, 1900, p. 597.

this variety of writing for the left hand is natural in left-handed people who have not been influenced by education.

The actual form of the characters is of little significance. We have often repeated the experiment and substituted Greek, German, typographic and stenographic letters, but always with the same result. It is perhaps worthy of note that in simultaneous writing considerable modification of the letters traced by the right hand occurs; they become hesitating and childish; the lines are sinuous and irregular, and the characters themselves ill distinguished. The same holds good for drawings.

On the other hand, the first attempt of the left to make mirror writing to order is frequently laborious. Mingled with true mirror characters will be found ordinary letters automatically traced, for automatism of left-hand movements is not the inevitable sequel of automatism of right-hand movements. From time to time the visual image of a normal letter rises in the mind, an image which does not correspond to that which the hand is endeavouring to express, whence doubt, reflection, arrest, and, usually, error. If, however, the subject allows his left hand to write, without preoccupying himself with the shape of the letters it is making, or with his eyes shut, automatism reasserts its sway and mirror writing results.

Of course a person who is asked for the first time to use his left hand in writing may force himself to trace ordinary characters, but to do so he must evoke the visual image of each letter and seek to reproduce the contours of this image slowly, yet often inaccurately. There is nothing automatic in this. Hence it is that ordinary writing with the left hand demands prolonged education and patient effort, and may never attain any rapidity, whereas mirror writing with the same

hand is acquired with facility in a more or less automatic manner.

It may well be that the natural left-hand mirror writing of which we are speaking is a purely motor phenomenon, since the calling up of the visual images of letters, so far from proving of assistance, is calculated rather to obscure and hamper it.

It has been pointed out by Ballet that variations in the aptitude for left-hand mirror writing exist, especially in the case of those who cannot write without the aid of the visual image of letters. Since they copy this image in using the right hand for caligraphical purposes, they are tempted to do the same when the left is in use. In fact, the facility with which one learns mirror writing seems to depend on one's power of writing without recourse to these images. The explanation of the ease with which the left hand reproduces, in the guise of mirror writing, the movements of the other, is to be sought in the symmetrical arrangement of the muscles in relation round the body axis. Physiologists tell us, further, that the simultaneous contraction of two symmetrical muscles is more readily attained than that of two asymmetrical muscles. The law of symmetry and the law of least effort correspond.

What is true of writing is no less true of all other forms of motor activity. In physical exercises the surest results are achieved by the synchronous contractions of symmetrical muscles, whereas education is much more arduous should this lesson from experience be ignored. For instance, nothing is easier than to make the arms describe circles in the same direction, but rotation in opposite directions is very difficult. Few people can revolve their thumbs in opposite ways. This is a matter of common observation among teachers of physical culture. The rapidity with which the action of swimming can be learned is in striking

contrast to the slowness with which the art of fencing is apprehended. Little effort is required of the music beginner if his pianoforte exercises demand the activity of symmetrical muscles for their execution; on the other hand, the playing of a scale by the two hands in unison comes only with long practice, since it entails the simultaneous use of asymmetrical muscles.

Facts such as these are of more than passing interest. One cannot afford to neglect their import where muscular education is concerned, whatever be its nature, whatever be its object. Yet there is an unfortunate tendency to concentrate attention on the development of the skill of one arm only, and that the right. Sometimes the use of the left arm for certain purposes is criticised adversely, and of course most people are congenitally less able to work with it. But habit, example, and even fashion, combine to render the right arm preponderant in everything, to the detriment of the other. It is a common occurrence to attribute awkwardness to this left arm, when its inferiority is really nothing else than a sign of faulty education. In many cases the left is as good as the right; its apparent *gaucherie* is because of its attempt at executing movements which are similar to those of the right, instead of those which are correspondingly opposite.

Thus experience shows that the education of the right upper limb is reflected on the left upper limb, although the subject may be sublimely ignorant of the fact. But though this influence be latent, it is none the less real, and may prove of service if occasion arise. Weber, Fechner, and Féré[1] have all devoted attention to this subject.

From the therapeutic point of view, considerable significance attaches to these facts. Temporary dis-

[1] FÉRÉ, "L'influence sur le travail volontaire d'un muscle de l'activité d'autres muscles," *Nouv. icon. de la Salpêtrière*, 1901, p. 432.

ablement of the right arm, such as follows fracture or arthritis or writers' cramp, need not be disconcerting, for the patient can proceed to utilise the faculty for mirror writing which his left hand has unconsciously acquired. In all affections which are accompanied by troubles of motility it is an excellent plan to apply the prescribed muscular exercises to both sides of the body, and the regularity with which they are performed on the sound side will have a corrective influence on the mirror movements of the affected side. We assume, of course, that there is no irremediable destructive lesion which interferes with the continuity of paths joining functional centres, otherwise the education of the normal limbs could not be expected to produce any beneficial effect on the other. It is especially in motor disorders of functional origin that mirror movements prove useful, and the frequent unilaterality of these disorders readily allows of the institution of a re-educative mirror drill. Speaking generally, the faculty of writing supplies us with the best means of attaining our end, for the variety of exercises it offers is likely to rivet the patient's attention, and he has proofs of his progress under his eyes. The goal in view is not, of course, the attainment of caligraphical perfection—the subjects of tic are seldom guilty of bad penmanship; but the execution of the required movements demands a voluntary constraint that cannot but be profitable.

After the séances of absolute immobility, then, our custom is to set daily exercises in writing, drawing, painting, tracing, ornamentation, etc., varying the indications in accordance with individual tastes and aptitudes. At the same time, we insist on the patient's devoting both hands simultaneously to his task. It will be found advantageous to devise movements for the fingers, then for the hand, the forearm, and so on, and to instruct him in each successively. Thus, one may

begin by having him make the movements in space, then with chalk on a blackboard placed vertically, then on the same placed horizontally, or on the ground; or he can be asked to trace symmetrical designs and ornaments on a wall. The essential points are that he use both arms simultaneously, symmetrically, and accurately, and that all inopportune gestures be inhibited.

In several of our cases procedures such as these have been adopted. O. was not long in acquiring the faculty of writing with both hands, the left tracing mirror characters. The object of the exercise was to oblige him to maintain tranquillity and a correct position of his head and neck, while his hands were simultaneously employed. By this means, as well as by synchronous drawing exercises, he soon became so deft that he learned to conserve almost complete immobility during the performance, to his great satisfaction. No less creditable results were attained with L. and with young J.

The method appears to us to be indicated above all in cases where the left arm is the seat of tic. Any one who can use a pen with his right hand is not long in acquiring the faculty of mirror writing with his left. In this way the simultaneous execution of a normal movement with right hand and left is facilitated, and the sound limb imposes regularity on the other. Whatever be the localisation of the tic or tics, this is the technique to adopt. It presents this advantage, that its combinations and permutations serve to stimulate the patient's interest, and he, at the same time, is required to keep a watchful eye on his involuntary actions; so is his will disciplined.

### REST IN BED

In the majority of cases absolute rest in bed is not desirable, but a youthful patient should always be sent

to bed early, and be allowed to lie long; twelve hours in bed is not excessive. This rule is one which must not permit of exceptions; whatever be the excuses invented by the parents, we should see that it is rigorously obeyed. Two or three hours' rest some time in the course of the day may be enjoined, provided the period be fixed and uninterrupted. To break in on frequent siestas with little promenades or with times of unrest is not productive of any good.

If it is impossible to maintain discipline during the day, absolute rest in bed for a longer or a shorter period may be counselled; the sedative effect of this measure cannot be gainsaid, especially when, for no apparent reason, exacerbations develop, with increase of emotional, obsessional, or other psychical phenomena.

### ISOLATION

Isolation is a rather severe proceeding, which, however, one must not hesitate to utilise in rebellious cases, or if the patient's mental state precludes the possibility of prolonged application of systematic discipline. Wyemann[1] cites a successful case, where a youth of seventeen, with a bad family history, suffered from convulsive movements in association with coprolalia, and was cured of the latter by isolation. Some would even recommend the removal of the patient to a hospital for mental disease. Such a step, however, is rather premature, for he may already have begun to improve where he happens to be, and it is not always certain that a sojourn of this character will be beneficial.

Before isolation is resorted to, it is important to familiarise oneself with the patient's mode of life, to

[1] WYEMANN, "Ueber ein Fall von Tic de Guinon," *Göttinger Dissertation*, 1900.

ascertain whether it is capable of modification in accordance with one's ideas for treatment, and to determine the exact influence of his environment on him. We have frequently had occasion to remark how potent is this environment as an etiological factor; with young people, in particular, negligence on the part of parent or guardian places the child in jeopardy. To combat this unfortunate tendency must be our aim, as soon as we are convinced of the risk.

Sometimes it is sufficient to draw the attention of the parents to the disastrous consequences of indulgence or indifference; but we shall show our wisdom in not relying too much on promises, however sincere and solemn. These parents may be perfectly honest in their protestations, but they are often as changeable and weak as their offspring, and lack that very firmness and perseverance which they imagine themselves capable of exhibiting. Thus, in spite of their undoubted intelligence and good will, their efforts at control are unsatisfactory, and under such circumstances the withdrawal of the patient from his family circle is urgently indicated.

We cannot think, nevertheless, that the asylum is the ideal—there is risk in the contiguity of other neuropaths or psychopaths; and while the value of rigorous isolation consists in its stimulating and quickening effect on the patient's self-control, whereby the day of his return to ordinary life is hastened, yet it too frequently happens that the old temptations are as powerful as of yore, and that the same causes which operated when his tics first made their appearance reawaken vicious tendencies more or less imperfectly masked.

Most subjects learn to still their tic during the physician's brief visit; further, most achieve a similar result while they remain inmates of a special institution;

but as soon as they find themselves in their old quarters, so soon does the impulse to tic dominate them again. In fact, their victory is incomplete; the ground they gain is not held. The goal to strive after is the repression of their tic under all conditions, apart from extraneous intervention and influence. Once he has been instructed in the methods of inhibition, the *tiqueur* has no one but himself to fall back on when face to face with the allurements of his daily life.

These reserves made, it is clear that removal of the patient from his environment has its advantages, but it is better to maintain only a degree of isolation, and to allow him to come into his own circle from time to time, under a wise supervision. The ideal measure would be to consign him to the care of an attentive and devoted teacher, whose superintendence would be permanent. In this respect, unfortunately, all that we can do at present is to indicate what we think a desideratum, for while well-to-do families may have their tutor, we do not know of any one who has held a corresponding office as an instructor of children with tic. The realisation of this novel proceeding might present genuine difficulties in practice, but we may hope that once parents, patients, and physicians are acquainted with the nature of tics and the efficacy of the re-education method, many prejudices against that fruitful therapeutic contrivance will vanish.

## PSYCHOTHERAPY

Immobilisation and regulation of exercise and occupation do not constitute the whole of the treatment; they form merely its objective side. Psychotherapy is another factor, of capital importance.

In the words of Brissaud, psychotherapy is an *ensemble* of agencies calculated to demonstrate to the patient where his will is at fault, and how

to exercise to the best advantage what of it is left. To come to particulars, his defect lies in his inability to check a cortical caprice. These are not rhetorical unrealities, nor is there anything mysterious about the method; it demands no special competence beyond the gentle and encouraging firmness of the ideal teacher. The physician can constitute himself instructor without having to borrow from the more or less occult practices of hypnotic suggestion. In fact, we must make it clear to the patient that the co-operation of the latter is indispensable, and that it is his will which is to come into action. The personal influence of the teacher will be exerted in sustaining his pupil's efforts, in making him take note of the progress effected, in keeping him to the allotted times for exercise and drill.

Thus, and thus only, is psychotherapy to be applied to tic. Lucid and sincere explanations and kindly counsels are wanted, not ceremonies and mysterious paraphernalia. Resoluteness, patience, clemency, and good sense are the weapons in the physician's armamentarium; docility, faith, and perseverance, on the patient's part, will enable him to emerge victorious. As soon as the compact is made, the battle against bad habits, where there is neither truce nor quarter, commences in earnest. The victim to tic will speedily unlearn the habit of perpetuating bad habits; he will, in addition, learn the habit of not contracting bad habits. In this way a double benefit—physical as well as moral—will accrue.

As a consequence, psychotherapeutical treatment directed specially to the subject's mental condition is scarcely necessary. The plans adopted to inhibit inopportune motor manifestations will prove of value for psychical imperfections.

Education might almost be considered a species of prophylactic treatment, intended to obviate the possible development of tics. Bourneville has verified this statement in his experience at Bicêtre:

Gymnastic exercises, and other measures directed towards the development of the child's faculties, ought to be conducted with kindness and

gentleness, and by the aid of boundless devotion and patience the methods of the authorities are bearing unexpected fruit every day. We are convinced that the infrequency of tic in such as have reached puberty is attributable rather to the zealous application of a sound pedagogical method than to anything connected with the age and physical development of the child.

Results that steadfast and patient nurses and teachers are obtaining in an institution like Bicêtre may surely be obtained by the physician in his private practice, if the parents of a youthful candidate for tic would appreciate the importance of discipline and unite, intelligently and assiduously, in the task of education. How common it is to find them solicitous only of loading his tender brain with learning, instead of endeavouring, with all their mind and heart, to restrain deplorable bad habits that may one day blossom into tics, to the distress of all concerned! The physician's earliest duty is to warn the parents of the dangers of indifference, and thereafter to install himself as teacher, if the disease should manifest itself in spite of his precautions. He has no choice in the matter, and he should have the frankness to say so, indicating at the same time on what his convictions rest. He need have no fear of damaging his professional prestige by the simplicity of his methods. Let him not promise what he may not be able to perform; encouragement, not deception, must be his watchword. Along these lines lies his duty as a physician; there, too, will he find that his treatment will be fraught with success.

# APPENDIX

*Les tics et leur traitement*, of which an English translation is here presented to the medical profession, was published at the close of the year 1902. In it our knowledge of the vexed subject of tics and spasms has been summarised and reviewed, and its reception in France, together with the fact of its having been translated into German without delay, prove that it has been regarded as the standard work on a topic the importance of which is being daily emphasised. At all the recent Congresses on the Continent the tics in one or other of their aspects have provided fruitful matter for discussion, whereas in England they have hitherto been greatly neglected. In the brief space of time that has elapsed since the book was produced there have been many and varying contributions to the subject, as a reference to the Bibliography herewith appended will show. Without doubt the reawakening of interest is in considerable measure due to the stimulus provided by the labours of MM. Meige and Feindel, yet it cannot be maintained that they have said the last word. In order that English readers may have before them the latest available information on the tics, various paragraphs from Meige's monograph (1905) have been incorporated, as has already been remarked in the Prefatory Note.

It is desirable, however, to indicate briefly certain points on which opinion is still divided, points on which the results of the most recent observations help to shed some light. Probably it has not escaped the reader's attention that the authors have with commendable wisdom refrained from dogmatising on some of these, although they are always able to give reasons for their adherence to one or other view. But in one respect at least the attitude which they have adopted has been unmistakable,

and that is in regard to the fundamental importance of agreement in the matter of terminology.

The amount of misconception that exists about what constitutes a tic is almost beyond credence; indeed, only those who have had occasion to examine the literature can have any adequate idea of it. Discussions at neurological and other societies not infrequently reveal how vague are the notions of many who must have more than a passing acquaintance with the disease clinically. Now, a great deal of this misconception would disappear if the distinction between a tic and a spasm elaborated by Brissaud were adhered to, as the authors so strenuously advocate. It is quite unnecessary to insist further on this point, but, on the other hand, it is only fair to state that even in France the views of Brissaud, Meige, and Feindel do not command universal acceptance.

M. Cruchet, of Bordeaux, to whom frequent reference is made in this volume, has in several communications on tic expressed himself at some length, and some of these have made their appearance since the publication of *Les tics et leur traitement*. According to him, the original meaning of the word "tic" is a movement arising in a "bad habit," and there would never have been any confusion had the term "tic douloureux" not been introduced. We know well enough the exact significance of this term, but its use led to the adoption of the cognate term "tic non-douloureux," and in the latter group two absolutely different conditions have been confused—viz. true tics, and spasms in Brissaud's sense. The difference between the two is now recognised everywhere in France; but in England and America, as Risien Russell points out in his article in Clifford Allbutt's *System of Medicine*, tic is still applied to such conditions as facial spasm and the involuntary movements of trigeminal neuralgia, whereas it should be reserved for what we usually call "habit spasm" and "habit chorea." The advantage of the word "tic" over these rather cumbrous terms must be patent to the unbiassed mind.

It is, however, in his persistent affirmation that a tic, to be a tic, must be clonic, that Cruchet disagrees with the tenets of Meige and Feindel. He has abandoned the use of the term "organic tic" in favour of spasm; and he maintains that

" tonic tic " and " tic of attitude " should give place to " habit attitude " and " convulsive attitude," as the case may be. His definition of tic is in the following terms :

> Tic consists in the execution—short, abrupt, sudden, irresistible, involuntary, inapposite, and repeated at irregular but frequent intervals—of a simple isolated or complex movement, which represents objectively an act intended for a particular purpose.

Curiously enough, however much this definition emphasises the clonic element in tic, Cruchet makes a subdivision into habit ties and convulsive tics, of which the former " are exactly comparable to normal movements, except that they are involuntary at the moment of their execution, are performed for no reason or purpose, and their frequency is unusual." Their difference from convulsive tics is merely one of degree ; a habit tic may become a convulsive tic, and some are convulsive from the beginning. A habit tic, if the movement be a slow one, is closely allied to the " attitude " ; and it is not always practicable to draw a distinction between them.

Thus Cruchet himself admits that the clonic element in tic may be minimal, so that the differences between him and our authors are by no means so insuperable as might be imagined. What he calls a habit tic is equivalent to the stereotyped act of the others, who hold, it will be remembered, that the movement of tic differs from the normal movement not merely by being involuntary, irresistible, inapposite, and so on, but also by being exaggerated.

It cannot be denied that in many cases of tic this exaggeration of the normal movement is anything but obvious ; many conform absolutely to the definition of Meige and Feindel, except that the movements are not violent, or grotesque, or " caricatures." To withhold the term " tic " on this account would be rather unfortunate, especially since no standard exists whereby to estimate exaggeration. Enough has been said, however, to demonstrate how insignificant are the discrepancies between the rival definitions.

Another question recently raised by Cruchet is the possibility of the persistence of tic during sleep.

The evidence he has adduced in favour of this has now been

accepted, as far as tics of the neck are concerned, by Meige. They are less abrupt and less frequent, it is true; otherwise, they are identical with the movements of the waking hours. A case of a hiccoughing tic persisting in sleep has come under my own observation within the last few months. Now, it is not difficult to understand that a movement such as tic, which occurs during the conscious state in spite of the will of the subject, may arise when consciousness is diminished. In fact, one wonders why they are not more frequently remarked, seeing that they are habitual movements, and habit movements are by no means uncommon in sleep. It is highly probable, of course, that the observation of the watcher is not minute enough, but there is another reason. The peculiarity of all, or almost all, of these habitual movements in sleep is that they are rhythmical—we may instance the head nodding and head rolling of children; but it is a noteworthy fact that they are often regulated by respiration. When it is recalled how respiratory drill is eminently calculated to diminish the frequency and lessen the severity of very many tics, it will be admitted that the regularity of the respiratory movement in sleep is the most likely explanation of the infrequency of tic during that period.

One other matter may be shortly alluded to. In Cruchet's terminology, a tic is an anomalous gesture, and cannot be applied to an anomalous attitude, since the latter is tonic rather than clonic. For an anomaly of attitude he suggests the use of the word "deformity." Hence "habit deformity" is comparable to habit tic, and "convulsive deformity" to convulsive tic. As a habit tic may develop into a convulsive tic, so a habit torticollis may degenerate into a convulsive torticollis. There is no reason why the operation of habit as a factor should not effect the latter transformation exactly as it does the former; and as habit is held to be a psychical phenomenon, it is easy to conceive why the term "mental torticollis" should have arisen, and been so widely accepted. But it will be readily understood that while Cruchet affirms that no mental torticollis can ever be a tic, in his sense of the word, this is due solely to his refusal to consider any movement which is tonic as partaking of the nature of tic. In all other respects, the description which he gives of mental torticollis shows that it is nought else than a tic in Meige's sense.

In an article on convulsive torticollis which has been contributed by Meige to the *Pratique medico-chirurgicale* (1907) he emphasises afresh the distinction between torticollis-spasm and torticollis-tic. The former is provoked by an irritative lesion in the motor nerves supplying the muscles of the neck, or in their nuclei of origin, and the character of the contractions ("contracture frémissante" [Meige], "contractions parcellaires," "contractions paradoxales" [Babinski]) in a definite peripheral nerve area is not likely to be mistaken. In other cases the objective phenomena distinctive of spasm are awanting: the characteristics of tic, on the contrary, are conspicuously present, and among these cases, where psychical disturbance plays a preponderant rôle, are to be found those described by Brissaud as mental torticollis.

It is to be noted that these writers alike decry the surgical treatment of torticollis, and perhaps not without good reason. Nevertheless the method must not be condemned on theoretical grounds merely, and it is permissible to believe that their experience may have been unfortunate. The records of the National Hospital provide many instances of surgical interference in torticollis and allied conditions of the neck, the results of which make one hesitate in expressing a dogmatic opinion. It is, however, impossible to enlarge further on the subject in this place.

S. A. K. Wilson.

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[In one or two instances, where the original paper has been inaccessible, its title is reproduced as given in the French edition, but in brackets. Through the kindness of M. Cruchet, of Bordeaux, I have seen the proofs of his new volume of 800 pages on *Les torticolis spasmodiques*, which is at present in the press (Masson : Paris). It is a splendid monograph on the subject, and contains many references to the literature.—S. A. K. W.]


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